A PROGRAM FOR MANAGEMENT
1958 . . . No. 6

JULY 14, 1958

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Finding Out What Customers Will Buy

. . . Page 101

● Steel Prices: How Users Will React . . . Page 61

● Titanium Alloys Ready for Space Age . . . Page 116

modernization . . .

AT MODERATE COST

In the modernizing, revamping, or up-dating of production facilities—several approaches are available. Components can be changed. Alterations can be made. New ideas can be adapted to existing equipment. New units can be added.

The proper choice can make a difference in production yield and the expenditure. The choice requires good thinking and proper application of ideas . . . by people who know their business.

We are working with many companies right now on idea modernization for butt weld, seamless, stretch reducing, continuous galvanizing, continuous annealing, electrolytic tinning, stainless processing, silicon processing, cold drawing, rubber, plastic and chemical.

A discussion of your ideas and plans may show how you can modernize at moderate cost.

AETNA•STANDARD

THE AETNA-STANDARD ENGINEERING COMPANY

General Offices: Pittsburgh, Pa. • Plants: Ellwood City, Pa., Warren, Ohio
Research Laboratory: Akron, Ohio

CONTINUOUS GALVANIZING LINES • CONTINUOUS ANNEALING LINES • CONTINUOUS ELECTROLYTIC TINNING LINES • SIDE TRIMMING AND SHEAR LINES AND OTHER FINISHING EQUIPMENT • CONTINUOUS BUTT WELD PIPE MILLS • SEAMLESS TUBE MILLS • DRAWBENCHES AND OTHER COLD DRAW EQUIPMENT • ROLLS AND CASTINGS • EXTRUDERS, MILLS, PRESSES FOR RUBBER AND PLASTIC

85 Tons of Tie Rods

Though they might remind you of big gun barrels, these massive forgings are tie rods for a 6500-ton hydraulic press constructed by Lake Erie Machinery Corporation, Buffalo, N. Y. Each of the rods is about 36 ft long; the combined weight of all four is slightly under 85 tons.

These pieces were forged, normalized, tempered, and finish-machined in the Bethlehem shops. Machining included threading at both ends. All in all, it was quite an assignment, one requiring a high degree of precision, for the rods had to be identical. No deviation from specifications could be permitted.

Bethlehem makes heavy forgings in an almost endless variety. But please remember, when thinking of Bethlehem, that smaller forgings have their innings, too. Some of the items produced in our drop-forge shops could be carried in your pocket.

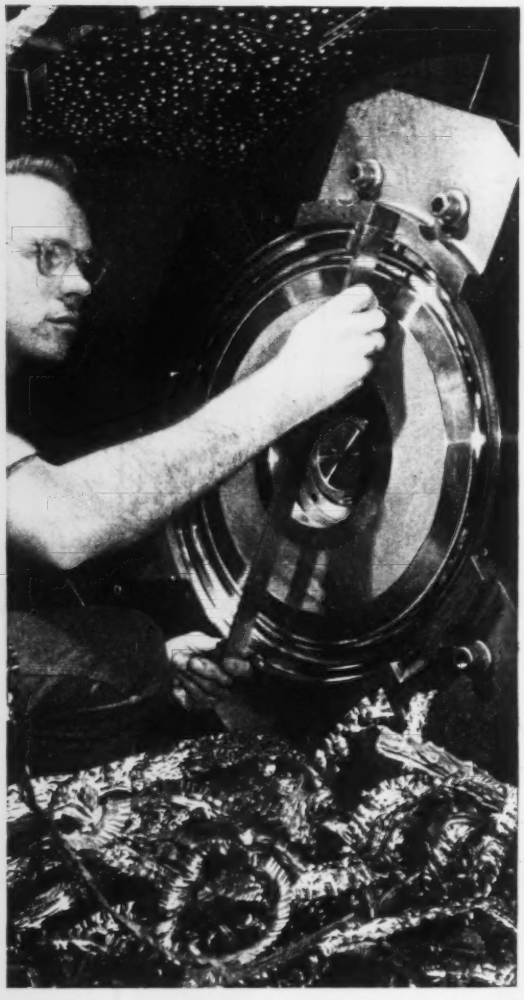
We suggest that you check with our engineers when next in the market for either large or small forgings. Press, hammer, drop, or upsetter—Bethlehem makes them all. And you can be sure that our prices and deliveries are fully competitive. Just phone or write our nearest sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



Take a new look at

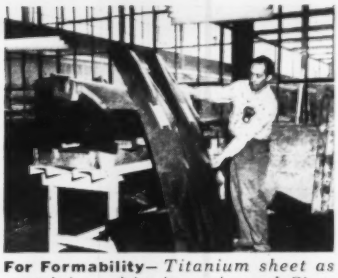
TITANIUM

Tough to fabricate? Not today. With Mallory-Sharon's strict quality control and continuous research, titanium becomes a metal of uniform quality and predictable characteristics. It's being successfully machined, welded, formed to exacting specifications . . . in both aircraft and commercial applications.

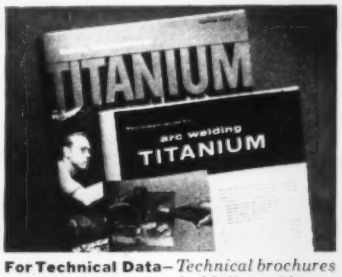
Check the examples shown here... then contact us for technical data or assistance on your specific application.

For Machinability—*Improvements in the chemistry of titanium now permit it to be machined as readily as stainless steel. Mallory-Sharon guarantees a maximum of 0.1% carbon—an element that causes machining difficulties if present in higher proportions.*

For Weldability—*Commercially pure titanium and some titanium alloys can be arc welded with good results, provided weld area is protected from contamination by the surrounding atmosphere. Other satisfactory methods include spot, seam and flash welding.*



For Formability—*Titanium sheet as stretch-formed for jet engine pod. Since Mallory-Sharon titanium is certified in a definite strength range, spring-back is predictable and allowed for in dies. Fabricators report very low scrap loss with uniform strength material.*



For Technical Data—*Technical brochures are available through Mallory-Sharon on machining, welding and forming of titanium. Write us for literature on the process in which you are interested. Our strong Service Engineering group is available to assist you on specific applications*

MALLORY SHARON

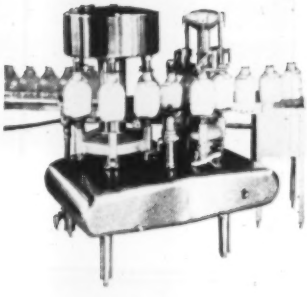
MALLORY-SHARON METALS CORPORATION · NILES, OHIO

Integrated producer of Titanium • Zirconium • Special Metals

Warner & Swasey No. 4 Turret Lathe machining stainless steel dairy equipment components (shown below) at Federal Mfg. Co., Milwaukee, Wisc.

Warner & Swasey No. 4 holds .0005" accuracy...

triples production rate for Federal Mfg. Co.



SPECIALIST producer of milk bottle filling and capping machines, Milwaukee's Federal Mfg. Co.—a small, but most progressive organization—is today enjoying a phenomenal growth. This is due to the dairy industry's enthusiastic acceptance of their new and unique 'Vacu-Matic' filling machines.

PROBLEM—Precision components of these machines—produced in average lots, ranging from 100 to 300 pieces—are of 303 stainless steel. Required machining tolerances were .0005", and surface finishes of 40 micro-inches had to be held in order to keep subsequent polishing costs to a minimum.

SOLUTION—Federal's Warner & Swasey No. 4 Ram Type Turret Lathe, combined with operator skill and a sound preventive maintenance program, adequately met the desired accuracy and surface finish specifications—and, in addition, increased production three times above rates obtainable on their older turret lathes.

OPERATOR REPORTS—"Ease of machine handling made possible our sizable production increase. We make full use of the lathe's 6 to 1 high-low shift and two-speed motor which instantly and effortlessly provide a choice of four speeds without preselection—a time-saver for changing speeds from turn, to ream, to cutoff, etc. In all, our No. 4 all-clutch hydraulic headstock, with its two-speed motor, provides a total of 24 *unduplicated* speeds—any of which can be preselected while under cut, and instantaneously thrown into action by the flip of a lever. We also like the higher speeds and the easier, faster handling of the apron controls."

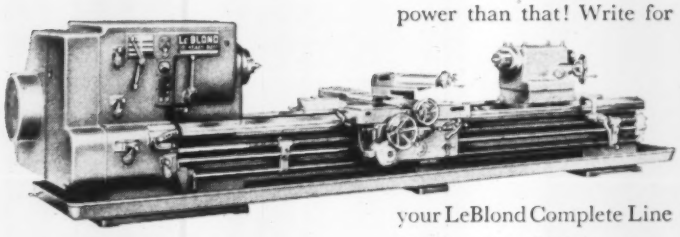
This is the kind of production you can expect in your own shop when you replace older turret lathes with modern Warner & Swaseys. Call in our Field Representative to talk about specific applications in your shop.

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS . . . WITH A WARNER & SWASEY

THE POWERFULEST LATHES IN EVERY CLASS YOU'LL FIND IN THE LINE OF LeBLOND

This is the 32" Heavy Duty —pride of the LeBlond Line. Able to push ceramics and carbides to their limits. 36 speeds at 60 HP—and engineered from power unit to cutting tool for far more power than that! Write for your LeBlond Complete Line Catalog No. C-58G.



THE R. K. LeBLOND MACHINE TOOL CO. CINCINNATI 8, OHIO

World's Largest Builder of A Complete Line of Lathes for More Than 71 Years

This Week in STEEL The Metalworking Weekly

July 14, 1958
Vol. 143 No. 2

EDITORIAL 59

Don't let the summer doldrums delay your plans for sharing in the prosperity ahead. The future won't wait!

SPECIAL FEATURE 101

Finding Out What Customers Will Buy

It's imperative now that the sellers' market has disappeared and we have expanded our industrial capacity. This article—No. 6 in STEEL's 1958 Management Series—tells how to go about the job.

WINDOWS OF WASHINGTON 68

Atomic program gets more than Ike sought as commission reins pass from Strauss to McCone.

MIRRORS OF MOTORDOM 75

It takes a year or more to get ready for a model changeover. Men at Buick explain why this is so.

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Business outlook for second half is decidedly better than that at the beginning of the year.

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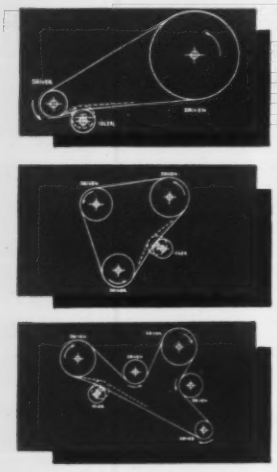
How to drive it with Acme chain and sprockets

Acme Precision Roller Chains and Sprockets are easily adaptable for most any drive where maximum efficiency is essential, a few of which are illustrated below.

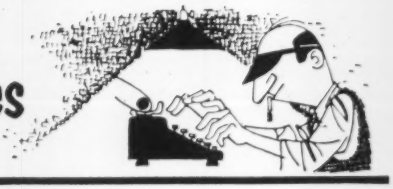


Acme Chains and Sprockets deliver Positive – Efficient – Economical – Flexible – Rugged – and Quiet Power Transmission. For the solution of your power transmission problems, send them to Acme.

Write Dept 10-A for new illustrated 100 page catalog which includes new engineering section showing 36 methods of chain driving.

Acme Chain Corporation
HOLYOKE MASSACHUSETTS

behind the scenes



Market Research

This week, friends, we will gather about Associate Managing Editor Vance Bell and consider the problems of marketing. Vance burned considerable energy researching and assembling this article, first because it was scheduled to be No. 6 in STEEL's Program for Management series, and second because Vance is deeply interested in marketing. The honest fellow lights up like a pinball machine when he hears a stock ticker tape—or a stock tape ticker—or a tick stape stocker—well, we're off to a bad start as usual. Let's get back on course by turning to Page 101, shall we? That's where the article on marketing begins.

Marketing is a course of commercial activity by which the exchange of commodities is effected, but the gimmick is this: Both buyer and seller must be satisfied with the exchange. Usually, the seller wants money, and the buyer wants products, and after the exchange each thinks he is better off. This is the angle that confused Omar Khayyam; he wondered how a winemaker could be foolish enough to sell his wares for money, when it was quite obvious that money wasn't half as precious as the stuff he sold.

Omar was a tentmaker by trade, and it is conceivable that he made and sold tents, when he wasn't dashing off stuff about loaves of bread and jugs of wine. Although he belonged to a world of tents, verse, and higher mathematics, Khayyam came from a race of supersalesmen, and modern marketing men may still learn from the Persians.

Marketing, Vance reports, is more than selling. It must precede production, rather than follow it. The company that builds a new product and then goes about trying to sell it is courting calamity—unless it has taken the precaution of doing a lot of full-time market research beforehand.

Before a product is sold it should be pretested to judge its acceptance. This reminds us that one of the Persian products was algebra; it has been tested for hundreds of years among school children, and most of them still reject it, so we're almost tempted to ask Mr. Bell: "If tests show that kids won't buy algebra, why do we still try to sell it to them?"

Distinguished Reader

A Russian schoolteacher, a pretzel bender, a French engineer, a rabbi—what do they all have in common? Many things, for all we know, but one is a certainty: They're all readers of STEEL. Our far-flung editors have encountered each recently—Editor-in-Chief Irwin Such met the teacher on his trip to the USSR; Editor Walt Campbell met the engineer at the Renault works in Paris; the pretzel bender queried Associate Editor Austin Brant on equipment; and Associate Editor Ross Whitehead met the rabbi, Alan Green, at a social function a while ago and learned that he was a frustrated engineer who worked off some of his frustrations by perusing STEEL.

"When he found out I was with STEEL," said Ross, "he practically cornered me. He reads STEEL all the time," he said—which was not a strict interpretation of the facts because all the time leaves no time for anything else—"and believe me, he knew what he was talking about, too."

Lowdown on Slowdown

Readers of the *Chicago Tribune* are familiar with this excerpt from its editorial page of Apr. 16, but maybe the rest of you aren't. It is called "The Lowdown on the Slowdown," and here's a bit of it:

"To clarify the cautious terminology of the experts, it should be noted that a slowing up of the slowdown is not as good as an upturn in the down curve, but it is a good deal better than either a speedup of the slowdown or a deepening of the down curve.

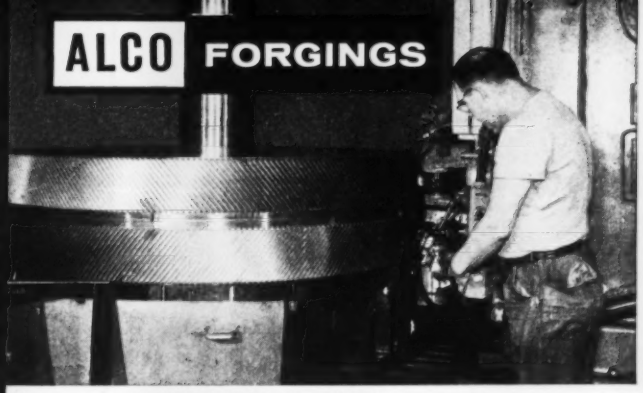
"Turning to unemployment, we find a definite decrease in the rate of increase, which clearly shows there is a letting up of the letdown. Of course, if the slowdown should speed up, the decrease in the rate of the increase of unemployment would turn into an increase in the rate of decrease of employment. In other words, the deceleration would be accelerated. This will be followed by a gentle pickup, then a faster pickup, a slowdown of the pickup, and finally a leveling off again."

Danse Macabre

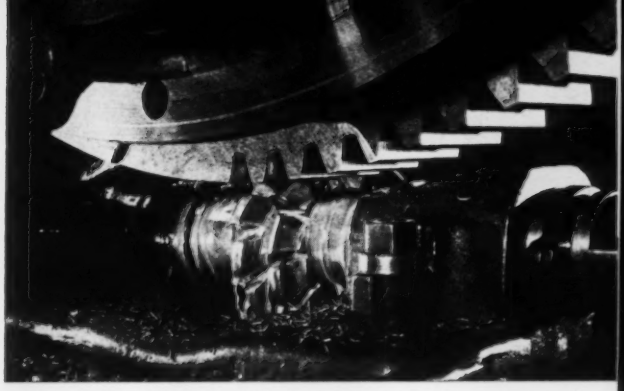
Four shrews, Russel, Percy, Wentworth, and Marvin, crouched in the corners of a barn that was 50 sq ft. As you know, shrews are cannibals; put any four of 'em in a box, and only one will be left. At the stroke of noon, each shrew headed directly for the other, clockwise, at a constant speed. Naturally, moving directly at the other, they will (hold your hats!) describe four congruent logarithmic spirals, which meet at the center of the square, and we can tell you right now that when they do meet, three of them are going to be in deep trouble. But we are not concerned with this: We want to know how far Wentworth traveled from his corner to the center of the barn.

Shrdlu

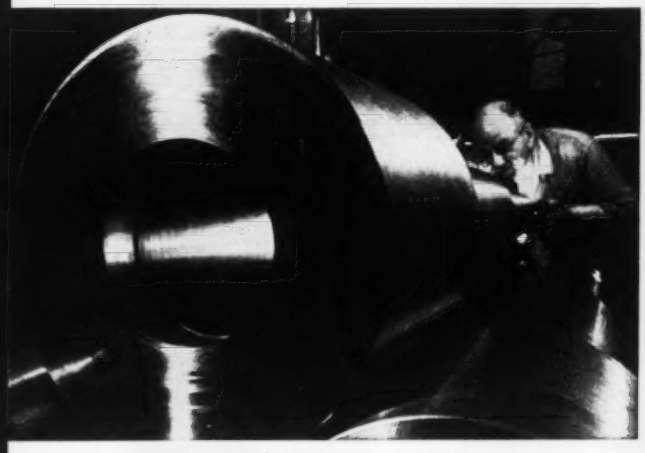
(Metalworking Outlook—Page 55)



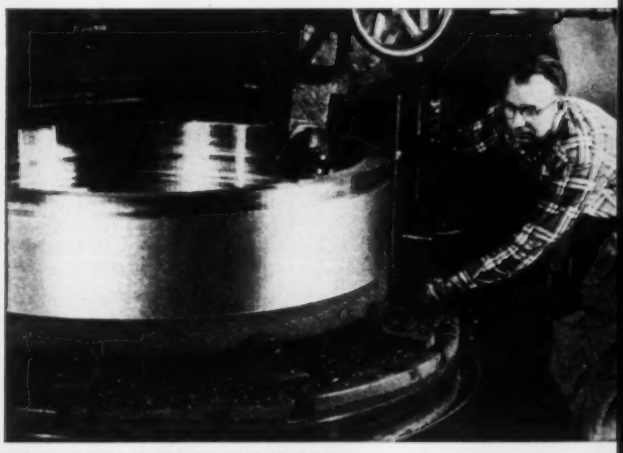
SAVES $150 PER GEAR—In cutting a double-web design fabricated gear on a gear generator, tool cost formerly averaged $180 per gear. By switching to ALCO Hi-Qua-Led Steel with its lower friction component, tool wear is reduced, and manufacturer reports savings of approximately $150 per gear.



8-HOUR JOB DONE IN 3—Another manufacturer reports that roughing and finishing a gear required a total of 8 hours and 8 minutes on his gear cutter. With freer-machining Hi-Qua-Led Steel and the increased speeds and feeds it permits, the job is now completed in just 3 hours and 10 minutes.



700% INCREASE IN TOOL LIFE—In trepanning a 4 in. diameter hole 42½ in. long with a Warner & Swasey lathe, tool life averaged one piece per tool. With Hi-Qua-Led, 8 pieces are now obtained with the same tool. Manufacturer reports that Hi-Qua-Led Steel also provides much better chip formation.



TOOL DOES 3 TIMES THE WORK—With Hi-Qua-Led Steel, a King boring mill operation that once required 3.4 hours is off the machine in 43 minutes. Through the lower frictional properties of Hi-Qua-Led Steel, the manufacturer obtains 10 pieces per tool grind as compared to 3 pieces obtainable with non-leaded steel.

HOW ALCO'S EASY-MACHINING HI-QUA-LED STEEL* FORGINGS CAN CUT YOUR PRODUCTION COSTS

The easy machinability of ALCO's Hi-Qua-Led Steel® forgings is setting new production records throughout industry. In case after case, a switch to Hi-Qua-Led Steel forgings has resulted in greatly reduced machine time, longer tool life and improved surface finish with closer tolerances.

These unique cost-cutting benefits are provided by Hi-Qua-Led Steel forgings with all the other physical characteristics of regular steel in the same AISI grade. You get the same service in your end product.

ALCO specialists will be happy to demonstrate these profit-boosting characteristics on your own machines, in your own plant. Forgings are available in seamless rolled circular shapes from 18 to 145 in. OD, in open-die shapes from 1,000 to 30,000 lb and 40 ft long, and in mandrelled seamless circular shapes up to 60 in. wide.

For a technical booklet on Hi-Qua-Led Steel forgings, write ALCO Products, Inc., Dept. 155, Schenectady 5, N. Y.

***HI-QUA-LED STEEL**—ALCO's registered trademark for its special process leaded steel forgings that are making outstanding reductions in machining time, tool wear and production costs.

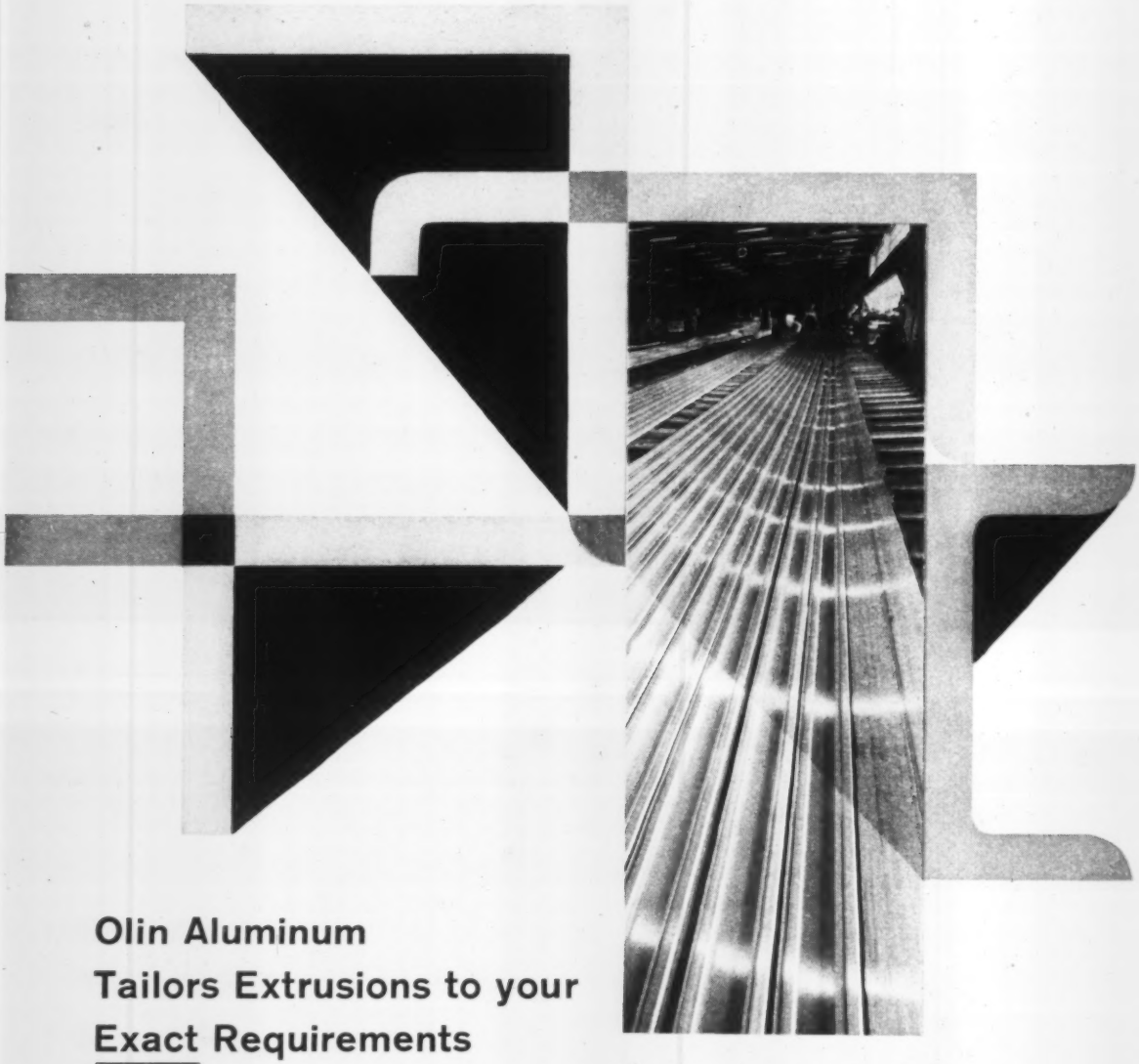
ALCO

ALCO PRODUCTS, INC.

NEW YORK

SALES OFFICES IN PRINCIPAL CITIES

LOCOMOTIVES · DIESEL ENGINES · NUCLEAR REACTORS · SPRINGS · STEEL PIPE · FORGINGS · OIL-FIELD EQUIPMENT



Olin Aluminum Tailors Extrusions to your Exact Requirements

Olin Aluminum is outstandingly equipped to produce aluminum shapes to meet your exact needs. It makes available to you the extensive facilities of a fully integrated source of supply – one that assures a steady flow of quality materials.

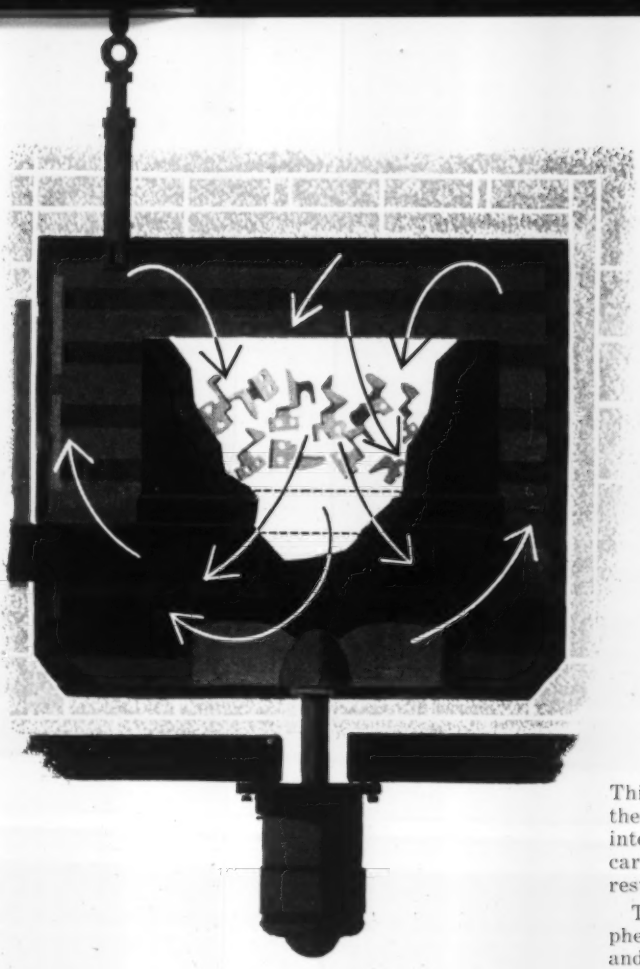
In producing these materials for you, we devote unusual attention to the precise details of your specifications. At every stage of production, we carefully inspect the work in progress. And we follow through with the same thoroughness to the packaging of your order – tailoring shipments to save handling time in your plant.

Produced and packaged right, your extrusions also get to you quickly. Speedy deliveries from Olin Aluminum can help you cut your inventory costs. For immediate service, write: Metals Division, Olin Mathieson Chemical Corporation, 400 Park Avenue, New York 22, N. Y.

OLIN MATHIESON CHEMICAL CORPORATION
OLIN ALUMINUM

Symbol of New Standards of Quality and Service in the Aluminum Industry

® AND "OLIN ALUMINUM" ARE TRADEMARKS



it's new!

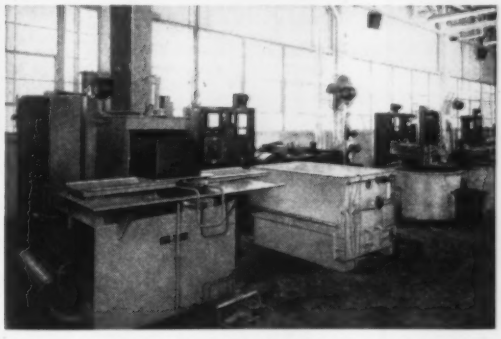
The L&N Tricarb method with controlled atmosphere . . . temperature . . . quench

This precision furnace is the most versatile in the history of heat treating. It can be used interchangeably for controlled case carburizing, carbonitriding, homogeneous carburizing, carbon restoration, or hardening.

The unique combination of Microcarb atmosphere control, Speedomax® temperature control and the controlled quench, makes possible significant quality improvements in production heat treating. New, efficient, L-O voltage radiant tube heaters are rugged, requiring minimum maintenance—are not subject to failures from carbon deposits when the furnace is used for carbonitriding without Microcarb control.

In many instances the Tricarb method has proved a practical solution to lower production costs . . . higher quality . . . more process automation . . . elimination of rejects and spoilage. In others it makes thoroughly practical the handling of many previously impossible or difficult heat treatments on a reproducible, production basis.

Folder T-620(17) explains the Tricarb Method. Write us at 4957 Stenton Ave., Phila. 44, Pa.



When small cams for electrical instruments are carburized in this Tricarb furnace, 6¢ per piece is saved on subsequent buffing operations because work comes from the furnace so clean.

LEEDS Instruments **NORTHRUP** Automatic Controls • Furnaces

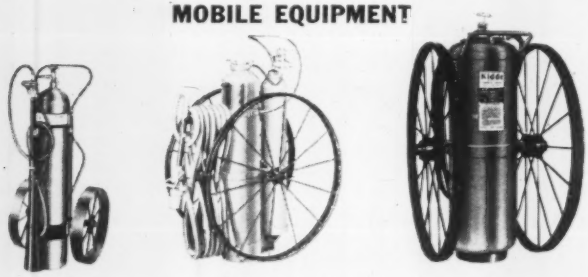
GET THE JUMP ON FIRE
with Kidde extinguishing equipment!

PORTABLE EXTINGUISHERS

Left to right: carbon dioxide trigger, carbon dioxide squeeze valve, 2½ gallon foam, 2½ gallon pressurized water, 20-pound pressurized dry chemical, 20-pound cartridge-operated dry chemical, 2½ gallon pump tank, one quart pressurized VL. Also 1 gallon pressurized VL and 1 and 1½ quart pump VL.

Kidde hand portables are designed to knock fires out *fast*, come in a variety of types and models. The Kidde line includes carbon dioxide extinguishers with fast-acting trigger release or squeeze-valve release in capacities of 2½ to 20 pounds. Kidde dry chemical extinguishers can be had in pressurized models of 5, 10, 20 and 30 pounds capacity, and in cartridge-operated models of 20 and 30 pounds. Kidde wet chemical extinguishers (foam, soda-acid) are available in 2½ gallon bronze or stainless steel models, including cartridge-operated and pressurized water or water-anti-freeze units. Kidde vaporizing liquid extinguishers come in pump capacities of 1 and 1½ quarts, pressurized in 1 and 1½ quarts and 1 gallon. Kidde pump tank extinguishers, in steel or copper shells, are available in 2½ and 5-gallon sizes.

MOBILE EQUIPMENT



Left to right: 100-lb. carbon dioxide, 150-lb. dry chemical, 40-gal. foam. Also 40-gal. soda-acid.

For major fire hazards, get a mobile unit. Wheeled carbon dioxide units are available in 50, 75, and 100-pound capacities, in one cylinder. Shut-off valve located at nozzle gives operator complete control. 150-pound dry chemical unit has straight stream for long range... fan pattern for wide coverage. Single-lever control for "on," "off," "fan," or "straight" discharge pattern. 50 feet of hose. 40-gallon wheeled foam unit delivers more than ten times its liquid content capacity in fire-smothering foam. Ideal protection against flammable liquid fires. All give expert results even with inexperienced operator.

SMOKE AND FIRE DETECTORS, CARBON DIOXIDE SYSTEMS

Kidde Industrial Smoke Detectors give you a fire warning where it counts—at the smoldering start of a fire—tell you fire's location, give you a visible and audible alarm.

Kidde Atmo fire detecting and warning systems afford wide-area protection, are ideally suited for cases where early detection of fire in valuable materials is essential. Working on the principle of rate-of-temperature-rise, Kidde Atmo systems give warning at the first hot breath of fire, can be used to shut off fans, close doors, etc.—all automatically.

Kidde carbon dioxide extinguishing systems are individually designed to fully protect even the most dangerous hazards, use pneumatic control heads to insure instant and complete carbon dioxide discharge. Directional valves afford protection to more than one hazard using the same bank of cylinders. All operating parts are self-enclosed for safety. Visual indicators show at a glance if system is "set" or "released." Thermostatically-operated systems, and package systems for 6000 cubic foot flammable liquid hazards are available.

Kidde

Walter Kidde & Company, Inc.
760 Main St., Belleville 9, N. J.
Walter Kidde & Company of Canada Ltd.
Montreal—Toronto—Vancouver

LETTERS
TO THE EDITORS

Depreciation Vital to Salesman

I would appreciate 15 copies of the article, "How To Reform Depreciation" (June 9, Page 65). In the sale of fabricating machinery, this subject is important to us. The material in your article would be helpful.

T. F. Eichstaedt
Assistant Manager
Machinery Div.
Joseph T. Ryerson & Son Inc.
Chicago

Reprint for Defense Counseling

We would like ten reprints of the article, "How To Sell for Defense" (May 26, Page 61). We propose to use this article in counseling with potential subcontractors in connection with the installation of the ICBM "Atlas" base at Cheyenne, Wyo.

Albert B. Kahn
Manager
Field Services
U. S. Department of Commerce
Cheyenne, Wyo.

Splendid, Timely Article

Please send 60 reprints of the Program for Management article, "Pricing for Profit" (June 16, Page 87). And a hearty pat on the back for a splendid and most timely article.

C. I. Schneider
President
Electro Lighting Corp.
Chicago

• • •

We are interested in ordering 2000 reprints.

Gertrude Miller
Ruder & Finn Inc.
New York

Facts on Space Age Metals

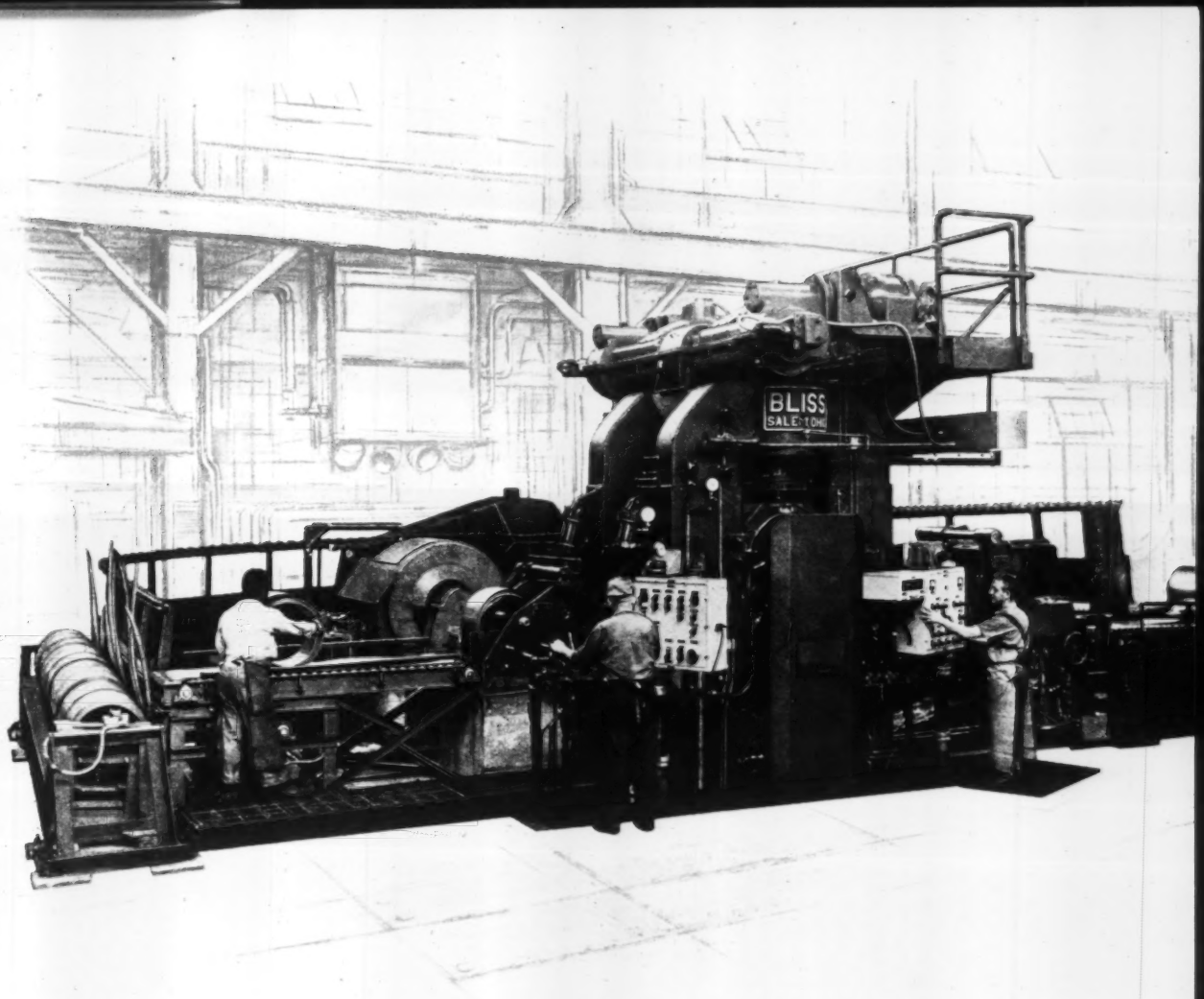
Please send two copies of the article, "Needed: Facts on Space Age Metals" (June 16, Page 102), which is indeed most interesting.

Guenter Doetsch
Charles G. Stevens Co.
Chicago

Helpful to BDSA Office

This office is anxious to obtain two copies of the article, "Electrical Steels: How To Choose and Improve Them"

(Please turn to Page 12)



HOW TO ROLL MORE FOR LESS:

replace three-and-a-half old-timers with one really modern mill

The recently-completed modernization program at H. K. Porter Company's Riverside-Alloy Metal Division has doubled the plant's capacity of specialty nonferrous alloys with essentially the same work force.

A central unit in the modernization is the Bliss 4-high intermediate mill shown here. According to Riverside, this single new mill provides greater production than the three old mills it replaces—a fourth old mill is still used to some extent, hence the three-and-a-half figure. Equipped with a run-around roller conveyor, the new mill coils metal on the first pass from ½-inch bars; returns the coils automatically to the entry side for further passes. Former practice was to roll flat for four or five passes before coiling.

Riverside reports that the new equipment will pay for itself in the short space of a few years. It's an outstanding example of the way a well-planned improvement program . . . plus Bliss rolling mill equipment . . . can bring new economy and efficiency to metal rolling. For other examples, write us today for a complimentary copy of our new 84-page Rolling Mill Brochure.

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Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio

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HYDRAULIC Boom Swinging, HYDRAULIC Topping, HYDRAULIC Telescoping, HYDRAULIC Load Hoisting! Fluid Drive, Power Steering. 5 sizes: 1½, 2½, 5, 10 and 12½ ton capacities. Ask for Bulletin No. 79.

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SILENT HOIST LIFTRUK

LETTERS

(Concluded from Page 10)

(June 9, Page 116). We feel it will be instructive and helpful to us.

M. L. Davis
Assistant Chief
Steel Products Branch
Iron & Steel Div.
Business & Defense Services Administration
Washington

• • •

Kindly send me three copies of this article. I will distribute the other two copies to our heating specialists.

Patrick J. Mulligan
Industrial Heating Specialist
Apparatus Sales Div.
New York District
General Electric Co.
New York

Request from Purchasing Agent

Please send three copies of the article, "Are Your Inventories Right?" (June 2, Page 35). I want them for further distribution in our organization.

Jay R. Burns
Purchasing Agent
Excel Body Corp.
Durant, Okla.

• • •

We would be pleased to receive two copies.

A. W. Lisius
Controller
Vapor Blast Mfg. Co.
Milwaukee

Data on New Brazing Metals

The May 19 issue contained an article, "Brazing Alloys Tackle Heat Barrier" (Page 140). If additional copies of this interesting report are available, I would appreciate one for my file.

Charles D. Cooper
Special Representative
Welding Products Div.
Metal & Thermit Corp.
Rahway, N. J.

Labor Contract Interesting

In reading your May 19 issue, I was especially interested in the Program for Management article, "Building a Labor Contract" (Page 125). Please furnish me with ten copies.

Harold A. Fye
Director of Personnel & Public Relations
Revco Inc.
Deerfield, Mich.

Thinks Well of Article

We would appreciate six additional copies of the article, "How To Get More from Machine Tools" (Sept. 23 insert). We of the industrial engineering department think this is a spendid article. All production foremen should have copies on file.

R. W. Heiselman
Industrial Engineering Dept.
Bearings Co. of America
Division of Federal-Mogul-Bower Bearings Inc.
Lancaster, Pa.

In the Caterpillar Tractor Co. plant, *this D9 Tractor is being lowered onto its track roller frame assembly. Many important components of both tractor and its crawler track are fabricated from Youngstown Bars.*

Accent on Excellence

Youngstown carbon and alloy steel bars

Whether they're busy at work on marine, mining, snow-removal, agriculture, oil field or logging jobs, progressive contractors and construction engineers—throughout the civilized world—rely heavily on the versatility and rugged dependability of their Caterpillar machines.

Built by Caterpillar Tractor Co., Peoria, Illinois, these advanced-design, diesel-powered, crawler units make use of the metallurgically-controlled physical properties of Youngstown Carbon and Alloy Steel Bars to provide increased strength and durability—as well as long, trouble-free service life.

Wherever steel becomes a part of things *you* make, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create products with an "accent on excellence".

Going is rough across this river in Pennsylvania, but the maneuverability of these Caterpillar No. 583 Pipelayers makes it "child's play" to position pipe accurately.

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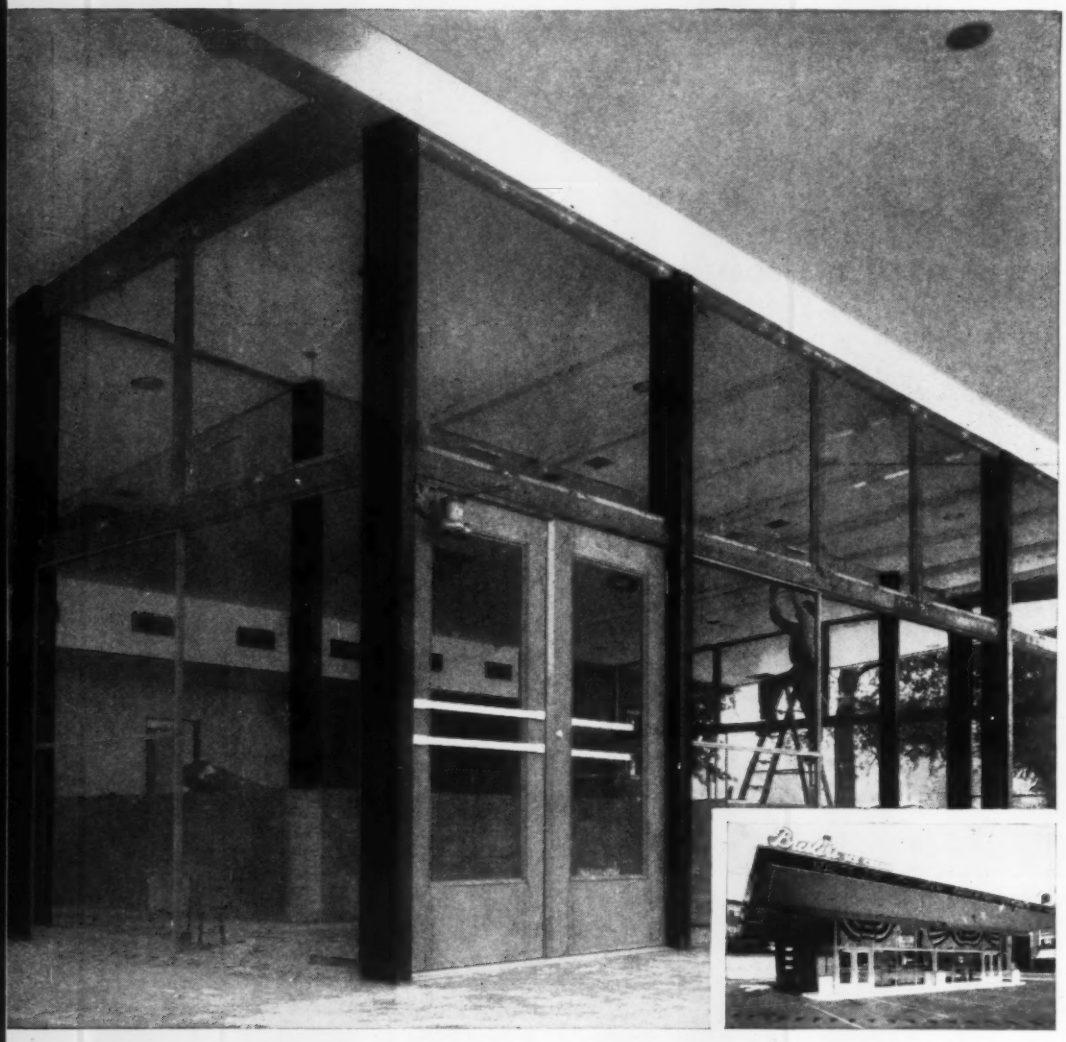
Manufacturers of Carbon, Alloy and Yoloy Steel, Youngstown, Ohio

How they built it better

with USS National Seamless



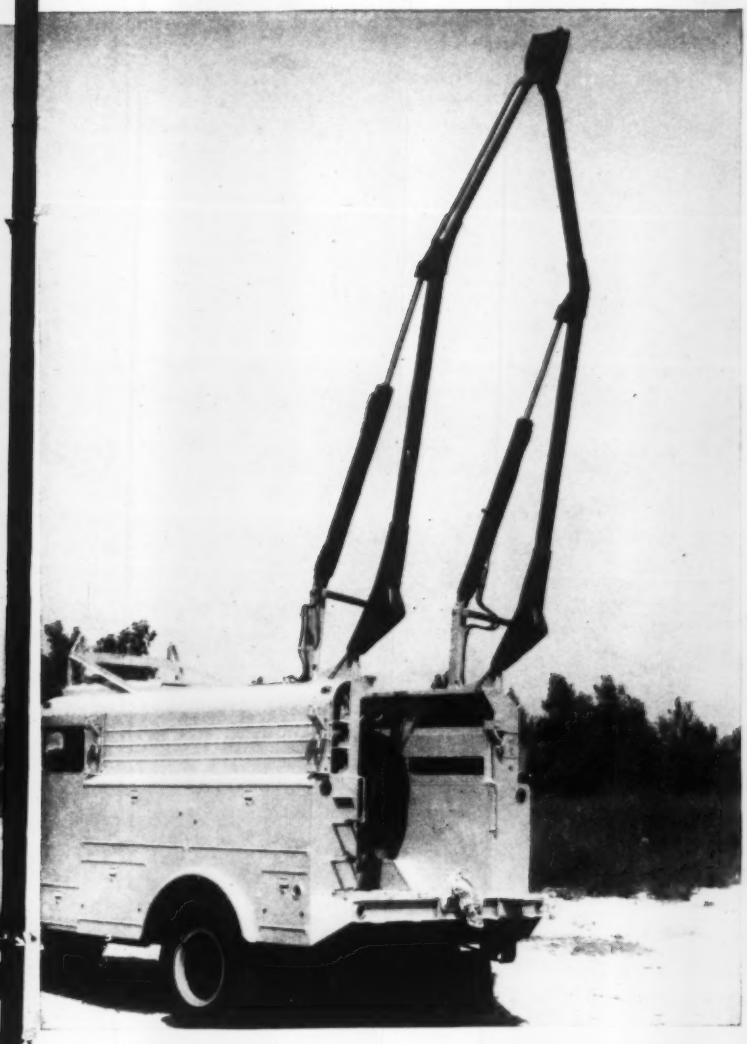
Drive-In Restaurant. This is one of a chain of Henry's self-service restaurants in the Chicago area. Built of steel, glass, tile and concrete, all of these buildings are identical in design. The unique feature is that every vertical supporting column in these buildings is fabricated* from sections of 4" x 8" Shelby Seamless Rectangular Steel Tubing. Four tons of this ¼" wall tubing were used in each restaurant. These columns of Shelby Seamless Tubing cost considerably less than did the previous method of forming and longitudinally welding squares and rectangular columns to specifications. Moreover, they are consistent in quality and strength, and provide a handsome, uniform appearance.

*Fabricator's name on request.

National Tube Division of USS United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • United States Steel Supply Division • United States Steel Export Company, New York

Pipe and Tubes



"Pole-Master"* Hydraulic Derrick. The powerful, two-legged boom of this hydraulic derrick is made of USS Shelby Seamless Mechanical Steel Tubing. The great strength, lightness, and shock absorbency of Shelby Seamless enables it to handle poles up to 75 feet in length with relative ease. The boom is activated by two hydraulic cylinders, also made of Shelby Seamless Tubing, which are powered by a heavy-duty hydraulic pump. Operating arc of the derrick is more than 180 degrees. It is designed to "set" or "pull" poles from the ground.

*Manufacturer's name on request.

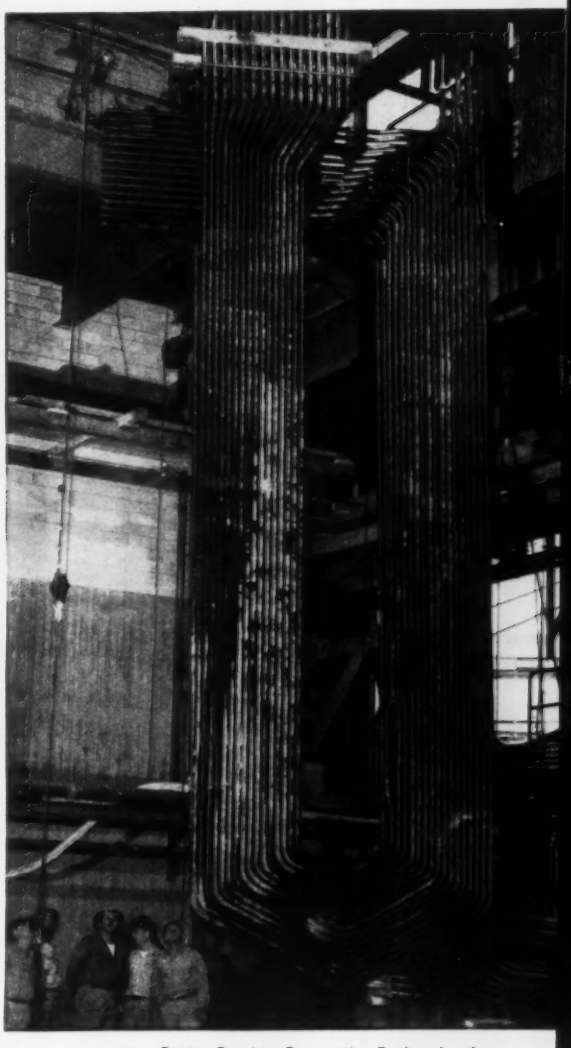


Photo: Courtesy Combustion Engineering, Inc.

Giant Superheater Coils. This king-size superheater coil being hoisted into position is only a small portion of the total USS National Seamless Steel Tubing installed recently in a huge modern boiler. Actually, *49 miles* of National Seamless Tubing were used. Here, steam at more than 2000 psi is superheated to 1000 °F. In spite of this severe duty, it poses no problem for National Seamless, which is, in fact, built to withstand much higher pressures and temperatures. National Seamless Tubes have the strength, uniformity and dependability of solid forgings.

Perhaps USS National Seamless Pipe and Tubes are just the materials you've been looking for to cut costs, lighten weight, increase strength, shock-absorbency and workability in your product. Why not get in touch with us and find out? Write to National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa. Or, for Shelby Seamless Tubing, contact your nearest Shelby Distributor.

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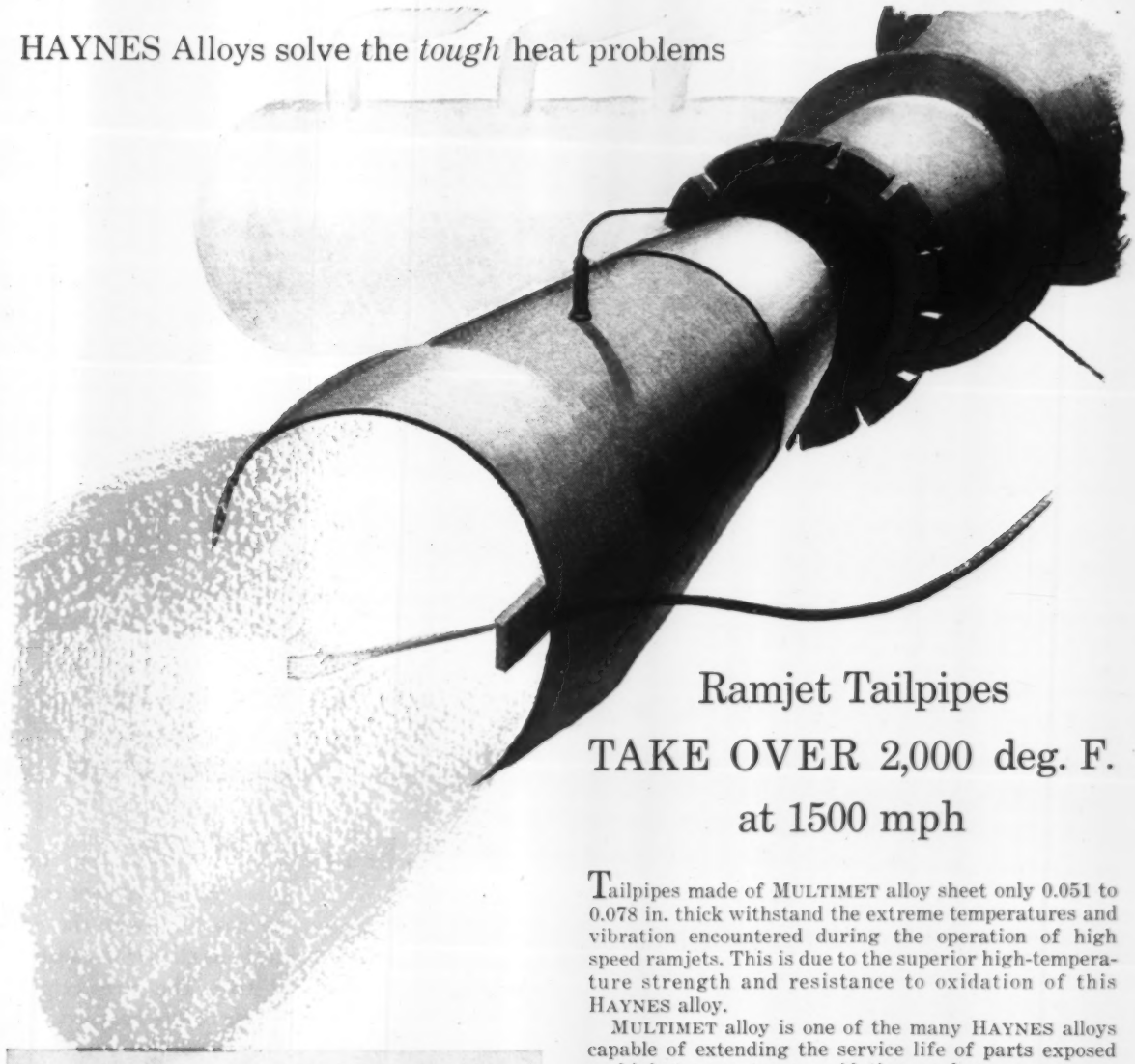
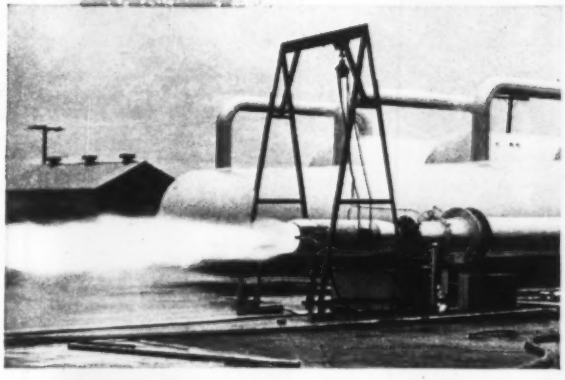


Ramjet Tailpipes TAKE OVER 2,000 deg. F. at 1500 mph

Tailpipes made of MULTIMET alloy sheet only 0.051 to 0.078 in. thick withstand the extreme temperatures and vibration encountered during the operation of high speed ramjets. This is due to the superior high-temperature strength and resistance to oxidation of this HAYNES alloy.

MULTIMET alloy is one of the many HAYNES alloys capable of extending the service life of parts exposed to high temperatures, oxidation, and stress. For descriptive literature write HAYNES STELLITE COMPANY, Division of Union Carbide Corporation, General Offices and Works, Kokomo, Indiana. Or contact our nearest sales office . . . Chicago, Cleveland, Detroit, Houston, Los Angeles, New York and San Francisco.



Ramjet tailpipes are formed from MULTIMET alloy sheet in four sections. The entire assembly is over 2 ft. in diameter at the large end and nearly seven ft. long.

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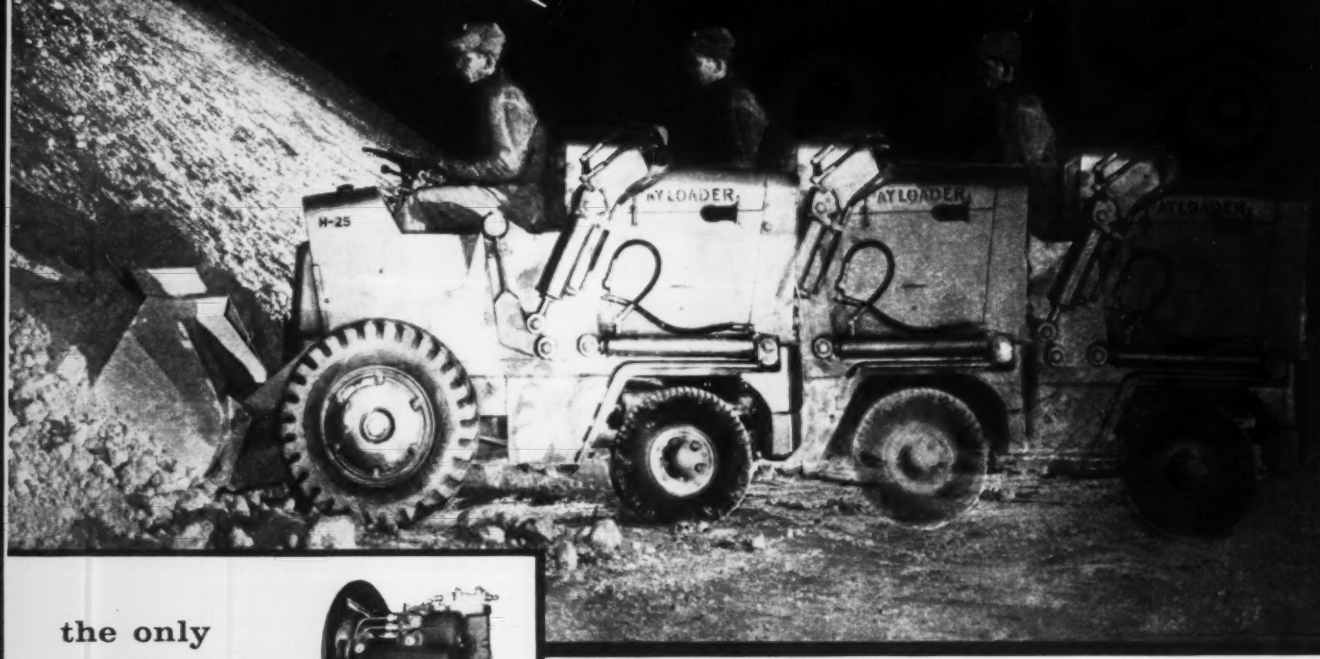

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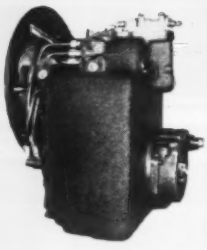

. . . having two speed ranges forward and two in reverse — the low range for digging power and close maneuvering—the high range for fast, economical travel in either direction.

All shifting, forward or reverse, is an instant finger-tip action with no need to stop between range shifts. The torque-converter is carefully matched with the transmission and is the more costly and more efficient two-phase type that automatically becomes a thrifty fluid drive when torque multiplication is not needed. Transmission and converter also keep comfortably cool because their oil is radiator-cooled.

This new **PAYLOADER** has more hustle than you've ever seen in a tractor-shovel. It's got everything to turn out big production all day long with the least operator effort and is the only machine in its class with *complete* power-shift transmission and power-steer. The carry capacity of 2,500 lbs. is 25% greater than has ever before been available in a tractor-shovel of its size and maneuverability, yet it easily goes in and out of boxcars with narrow 6-foot doors.

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The H-25 is *full* of other plus features that mean more production, less maintenance and longer life: closed hydraulic system, wet-sleeve overhead valve engine, triple air cleaners, full-shift fuel capacity, 4,500 lbs. of bucket breakout force and 40° bucket tip-back, to mention only a few.

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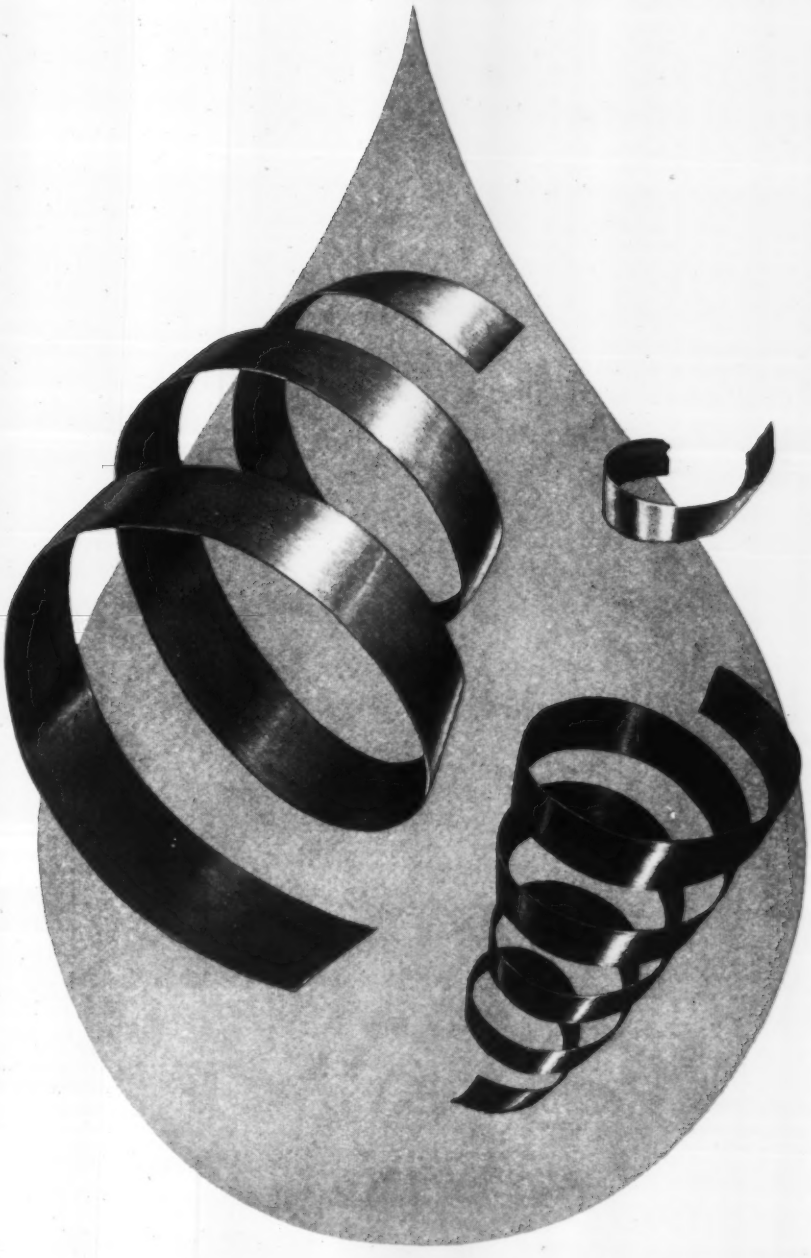

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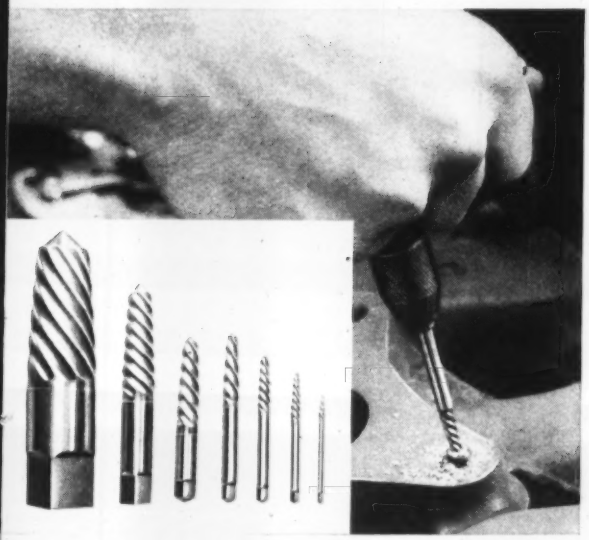
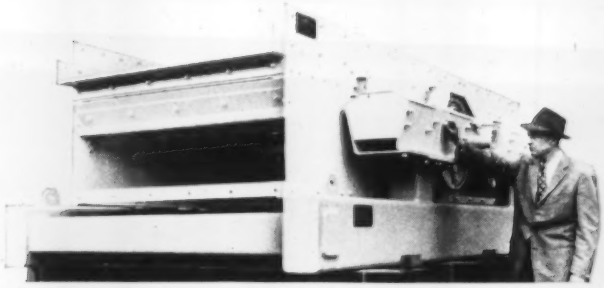
Equally important, from Fram's standpoint, is the excellent workability of Republic Terne Plate. The parts for which it is used – inner primary plate, center tube, carburetor tube, and cover plate – require severe fabricating operations. The 2¾" diameter, 2¾" deep center tube, for example, is drawn from a 6¾" circular flat blank. The cover plate is "hemmed" around the perimeter to produce a double thickness. Republic Terne Plate withstands these and other punishing operations with no cracking or flaking of the coating or loss of its ability to fight corrosion. In addition, the coating requires no preparation to provide an excellent base for painting.

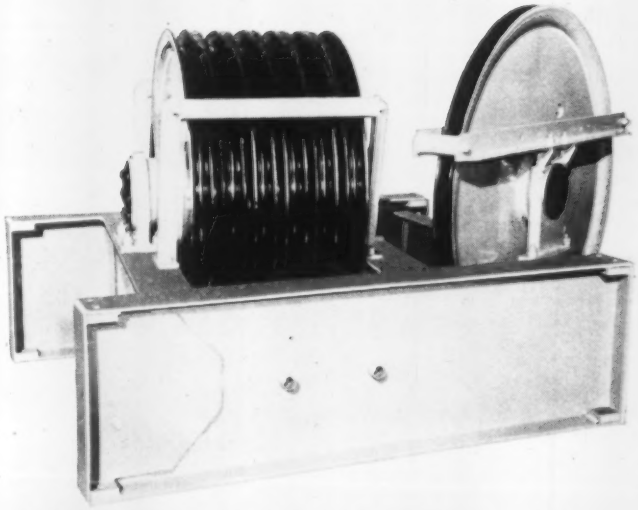
It will pay you to consider all of the advantages of Republic Terne Plate in relation to your own sheet steel product service and manufacturing requirements. For complete information, contact your nearest Republic office, or send coupon.



QUALITY AND ECONOMY ARE ASSURED in screw extractors made of Republic Cold Drawn Leaded Alloy Steel by the Henry L. Hanson Company, Worcester, Massachusetts. Beneficial characteristics of this versatile material include high machinability, formability, hardenability, and toughness. As a result, screw extractors can be produced faster and at less cost than was possible with former materials and, after scientific heat treatment, are practically unbreakable. Republic Cold Finished Alloy Steels are available in every standard analysis, plus many specials. Mail coupon for further information.



FINE-THREAD REPUBLIC CAP SCREWS of several different steel analyses are used for assembly of major components in Ty-Rock Vibrating Screens, built by the W. S. Tyler Co., Cleveland, Ohio. Use of these fasteners enables Tyler to distribute loads better and eliminate danger of fatigue failure due to vibration and cyclic loading. Republic produces more than 20,000 standard and 8,000 special types and sizes of fastener products to meet a wide variety of production and product requirements. Send coupon for details.



ASSURANCE OF STRENGTH WITHOUT EXCESS WEIGHT is a major reason why the Lee C. Moore Corporation, Tulsa, Oklahoma, uses Republic 4150 Hot Rolled Alloy Steel for shafting in cantilever mast crown blocks. Shafting must be able to absorb shocks and impact without failure while carrying massive weights of drill pipe. Location of the crown block in the top of the rig makes light weight vital. And yet operating safety is of paramount importance. Republic Alloy Steel meets all of these requirements and provides high abrasion and fatigue resistance as well. Republic Alloy Steels provide strength, safety, and economy in thousands of product applications throughout industry. For complete data, mail coupon.

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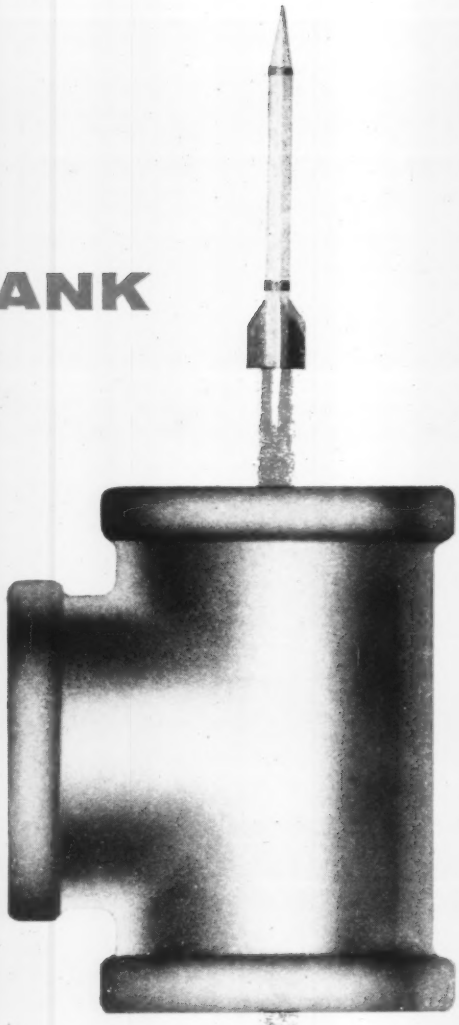
FROM STORAGE TANK TO GUIDED MISSILE

AT MINUS
452 DEGREES



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CALENDAR

OF MEETINGS

July 23-26, National Tool & Die Manufacturers Association: Summer board meeting, Mt. Washington Hotel, Bretton Woods, N. H. Association's address: 907 Public Square Bldg., Cleveland 13, Ohio. Executive vice president: George S. Eaton.

Aug. 11-14, Society of Automotive Engineers: National west coast meeting, Ambassador Hotel, Los Angeles. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Aug. 19-22, American Institute of Electrical Engineers: Pacific general meeting, Hotel Senator, Sacramento, Calif. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Aug. 19-22, Western Electronic Show & Convention: Pan-Pacific Auditorium, Los Angeles. Information: WESCON, 1435 S. LaCienega Blvd., Los Angeles 35, Calif.

Sept. 7-12, American Chemical Society: National chemical exposition and conference, International Amphitheatre, Chicago. Society's address: 1155 16th St. N.W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Sept. 8-11, Society of Automotive Engineers: Farm, construction, and industrial machinery meeting, production forum and engineering display, Milwaukee Auditorium, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Sept. 10-11, American Die Casting Institute: Annual meeting, Edgewater Beach Hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

Sept. 11-12, Refractories Institute: Fall meeting, Broadmoor Hotel, Colorado Springs, Colo. Institute's address: 1801 First National Bank Bldg., Pittsburgh 22, Pa. Executive secretary: Avery C. Newton.

Sept. 14-19, Instrument Society of America: Annual instrument-automation conference and exhibit, Convention Hall, Philadelphia. Society's address: 313 Sixth St., Pittsburgh 22, Pa. Executive director: William H. Kushnick.

Sept. 16-18, Electronic Industries Association: Fall meeting, St. Francis Hotel, San Francisco. Association's address: 1721 DeSales St. N.W., Washington 6, D. C. Secretary: James D. Secrest.

Sept. 22-25, American Mining Congress: Metal mining and industrial minerals convention and exposition, Civic Auditorium, San Francisco. Congress' address: 1102 Ring Bldg., Washington 6, D. C. Executive vice president: Julian D. Conover.

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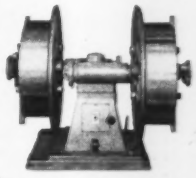
Ball bearing smoothness. Adjustable brake. Adjustable in height. Tilts to any angle for unreeling. Takes coils up to 600 lbs., 10" wide, 46" max. O.D., 8½" to 20" I.D.



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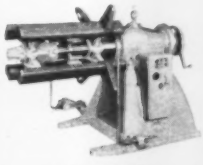

No. 60-30 MOTOR DRIVEN REEL
with automatic centering. Takes up to 6,000 lb. coils, 30" wide, 48" max. O.D. 16" to 20" I.D. 3 HP, 1200 rpm motor.

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HANDLING OF COILS FROM 100 LBS. TO 20 TONS

A Littell Reel *best* meets your need for fast, safe coil handling and accurate pay-off. The Littell Line offers all types of reels as well as all sizes . . . Manual Reels, Motor Driven Reels, Double Reels and the newest design Brake Reels. All are designed and built with the engineering and experience that has made Littell Reels the standard of performance since coil stock first came out.

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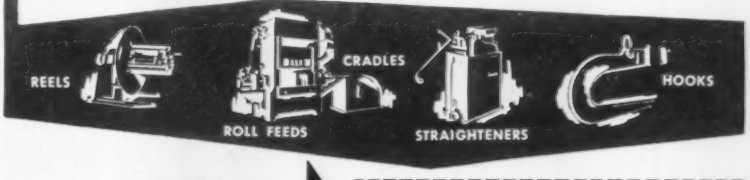

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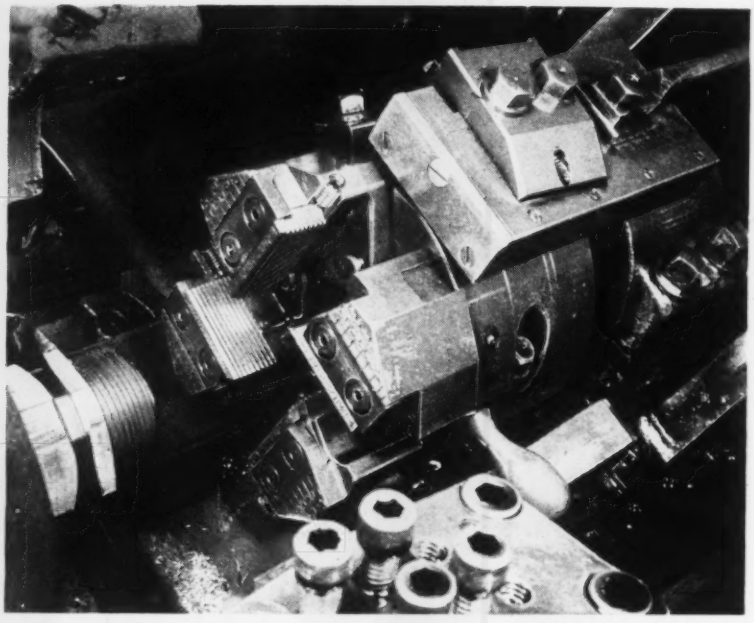
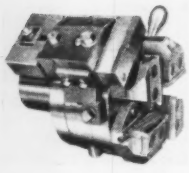


STAINLESS STEEL TAPERED THREADS

cut with Better Finish, Longer Tool Life



1½" Tapered Pipe Threads are cut in 304 stainless steel reducing bushings at Camden Machine Company, New Haven, Conn. These threads are produced by a 1¼" LANDMATIC Taper Attachment Head on a 3¼" Gridley single-spindle automatic at 15 surface feet per minute.

The thread finish is greatly improved from previous methods and 1000 pieces are completed between chaser grinds—an increase of more than 10 times.

These improved results can be entirely attributed to the use of the Taper Attachment and the free cutting action of the Landis Tangential Chaser. Through the Taper Attachment, cutting action is limited to the throat section or chamfer of the chaser, allowing the thread to be cut quickly with little "cold-working." This action reduces cutting strains to a minimum and results in uniform tapered threads.

LANDIS Taper Attachment Heads are stationary self-opening heads for cutting tapered threads of all types. Six sizes of heads thread all diameters from ¼" to 6". Ask for Bulletin F-90.

THE WORLD'S LARGEST MANUFACTURER OF THREADING EQUIPMENT - CUTTING - TAPPING - GRINDING - ROLLING

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415

USS "T-1" Steel can be flame cut, welded, formed, sheared, punched, machined or forged.

How to **beef-up** your equipment without adding fat

Build it stronger, tougher and lighter with USS "T-1" Steel. This remarkable steel was developed especially to meet the needs for bigger tools, stronger equipment, larger yet less massive structures.

USS "T-1" Steel is a low carbon, quenched and tempered constructional alloy steel combining weldability and formability with exceptional strength and toughness. Because of its high yield strength (100,000 psi minimum) you can cut weight safely—in actual applications, as much as 25% to 50% weight reductions have been achieved.

Total costs can frequently be reduced, too. In applications such as heavy machinery, rotating parts, pressure vessels and bridge members, steel costs can be lowered by reduction in cross section and substantial savings experienced in welding, maintenance, freight and erection costs.

Also, in equipment subjected to impact abrasion, USS "T-1" Steel pays off. Users report service life increases ranging from 25% to 100%—or more. Power shovel buckets, bulldozer blades, coal and ore bins . . . all cost less in the end when made of "T-1" Steel because they last longer, cost less to maintain.

Write for free book. The many advantages, applications and cost-saving features of this versatile steel are completely described in our book USS "T-1." United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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USS **United States Steel**

Why cyclotron magnet frames are made from forgings

Man is in a desperate race to learn more about magnetics. One famous acres-big cyclotron could be reduced to the size of a steamer trunk if they could only find a way to increase the magnetic field strength by 20 times. And already we see evidence that very strong magnetic fields may hold the secret to one of man's most sought-after dreams: sustained nuclear fusion power generation.

But when you double the strength of a magnetic field, the energy density or pressure increases *fourfold*. A not-uncommon 50,000 gauss magnetic field exerts a pressure of about 1,400 psi; but other laboratory experiments have already created fields of 1½ million gauss for a few microseconds, and they confidently expect to hit *10 million* gauss before long!

To contain the fantastic forces, designers of very large electromagnets turn to high-quality forged steel parts, and they very often come to United States Steel to ask for USS Quality Forgings.

The picture shows a cyclotron electromagnet frame that will go into service at Oak Ridge National Laboratory, Oak Ridge, Tennessee. It is made from six USS Quality Forgings that total 193 tons including the two cylindrical pole pieces. The pole pieces are machined to a .005″ flatness, and are parallel to within .005″. These tolerances are essential for close control over the bombarding particle beam—which often operates at velocities which approach 50,000 miles *per second*. All six forgings were melted, forged, machined, heat-treated and inspected right at our Homestead Forgings Division, and we also furnished all dowels (4½″ in diameter), nuts, bolts and lifting eyes.

Many cyclotron and nuclear reactor parts are made from USS Quality Forgings because buyers have learned that they are made from the finest steel, on the most modern equipment, by the most skilled forging men in all the world. No matter what kind or size of USS Quality Forgings you buy, you get the advantage of these same facilities. Please address inquiries or requests for our free forgings booklet to United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

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USS United States Steel

To date, monolithic flat arch cover (refractory concrete made with LUMNITE calcium-aluminate cement) has provided 4 years' maintenance-free service in pit-type gas annealing furnace. Service Foundry Division, Avondale Marine Ways, Inc., New Orleans.

"...installation time cut in half...no maintenance...less heat loss,"

says Carl W. Goodgion, Chief Metallurgist, Service Foundry Division, Avondale Marine Ways, Inc.

- Refractory concrete (made with LUMNITE cement) resists extreme variations in temperature and repeated thermal shock — gives longer service life to furnace parts and linings.
- Installation is fast, easy, economical — concrete reaches service strength in 24 hours.

For maximum convenience, use castables made with LUMNITE cement. These are packaged mixtures, ready for use. Simply add water, mix and place. Made and distributed by leading manufacturers of refractories.

For literature on refractory concrete, write: Universal Atlas, 100 Park Avenue, New York 17, N. Y.

L-170

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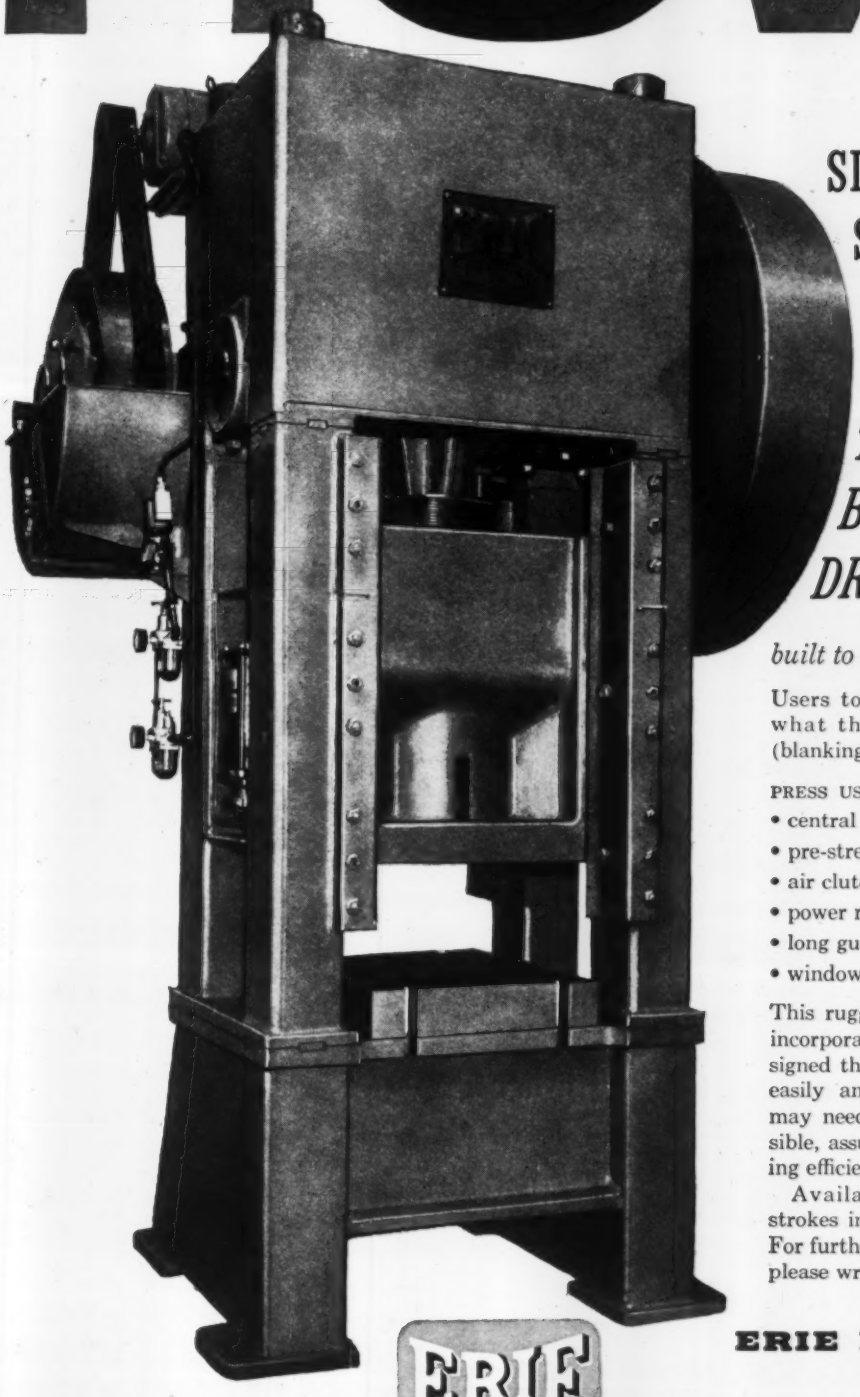

SINGLE POINT, STRAIGHT SIDE PRESS for *TRIMMING BLANKING DRAWING*

built to J. I. C. standards

Users told Erie Foundry engineers what they wanted in a trimming (blanking and drawing, too) press.

PRESS USERS ASKED FOR:

- central forced lubrication
- pre-stressed strain rods for rigidity
- air clutch and brake
- power ram adjustment
- long guide faces, easily adjusted
- windows in the side housing

This rugged new Erie Foundry press incorporates all these features so designed that maintenance may be done easily and quickly. All parts which may need servicing are readily accessible, assuring maximum press operating efficiency.

Available in various speeds and strokes in sizes from 150 to 600 tons. For further information, or quotations, please write.

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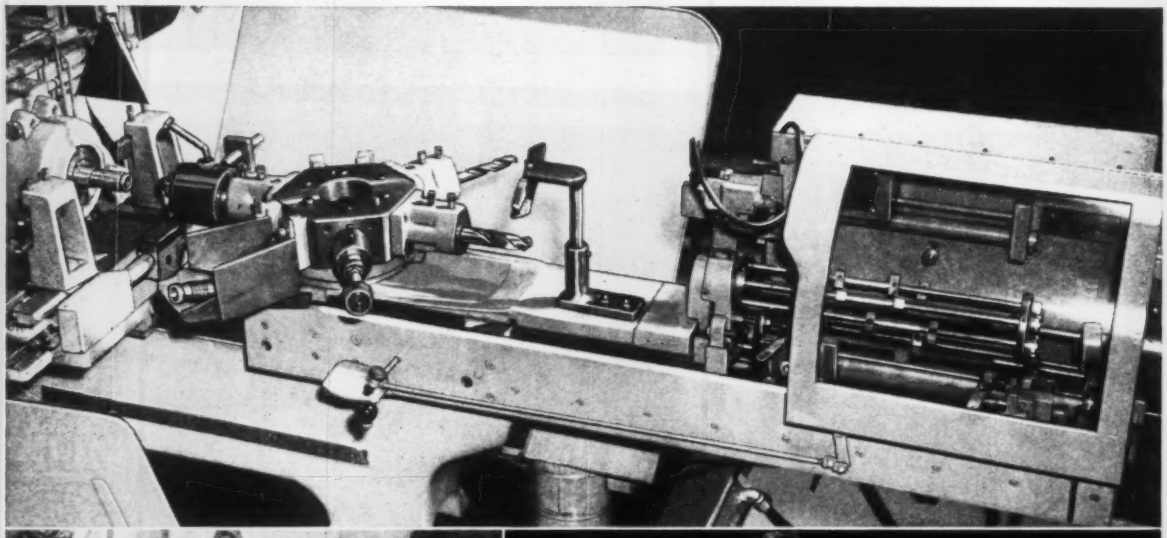
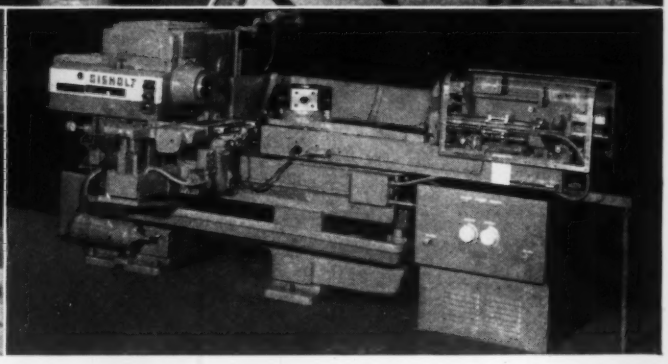
World's greatest name in forging machinery since 1895





250% Production Increase with this setup

Gets full automation on small job-lot production runs using hydraulic drive on Gisholt Ram Type Turret Lathe

Floor-to-floor time on the job shown here—a threaded collar $3\frac{1}{8}$" long with $1\frac{11}{16}$" diam.—was cut from 8.1 minutes (with hand operation) to just 3.25 minutes. All operations and machine functions are automatically controlled with the Lynn Hydraulic Drive Unit on a Gisholt Ram Type Turret Lathe.

Here's how the finished workpiece is completely machined from bar stock in one fast, automatic operation: The stock is fed pneumatically against a turret stop, chucked, start-drilled, then finish-bored with a large drill. The hydraulic drive backs the drill out automatically to clear the chips, then rapid traverses back to where it left off before dropping into feed to resume drilling. Spindle speed automatically decreases as tools on the front cross slide form the O.D., drops into lower speed as O.D. is threaded, and into another low speed as radii are formed on the finished part and on the end of the bar stock. A tool on the rear cross slide cuts off the finished part and the job is done in record time.

With its massive design, reserve power and extra spindle speeds, the new Gisholt MASTERLINE Ram Type Turret Lathe is particularly adaptable to complete automatic operation with Lynn Hydraulic Drive. Contact your Gisholt Representative. He has the complete facts—and his wide experience may point the way to more profitable operation for you.

MASTERLINE GISHOLT SINCE 1887 GISHOLT

GISHOLT MACHINE COMPANY
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WRITE GISHOLT TODAY for all-new, 18-page illustrated Bulletin 1174-B covering features, accessories, tools and floor plans on new Gisholt MASTERLINE Ram Type Turret Lathes.

ASK YOUR GISHOLT REPRESENTATIVE ABOUT GISHOLT FACTORY REBUILT MACHINES WITH NEW MACHINE GUARANTEE

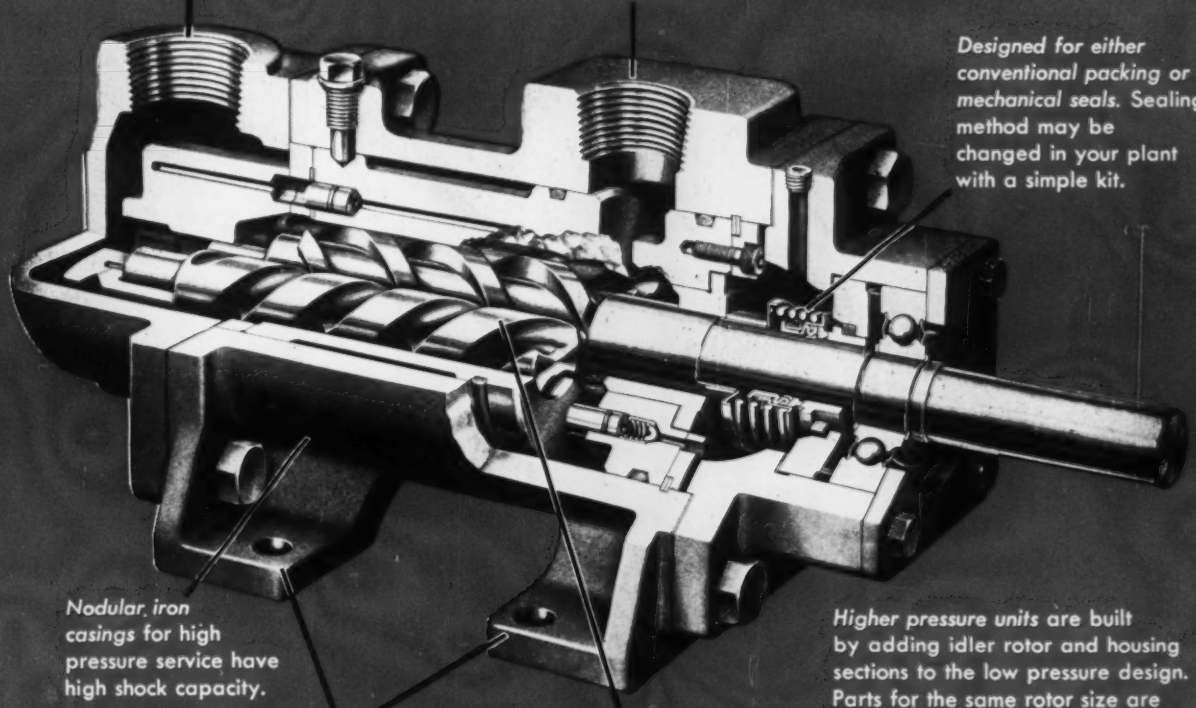
DE LAVAL IMO PUMPS

are now more versatile than ever

De Laval IMO pumps have proved that they do a dependable job over long years of service. The reason is IMO design simplicity. These constant displacement rotary pumps have only three moving parts—smoothly intermeshing rotors that propel the fluid axially in a steady flow without churning, pocketing or pulsation. There are no timing gears, cams, valves, sliding vanes, or reciprocating parts to wear or become noisy. *Quiet*, compact IMO pumps are excellent for direct-connected, high-speed operation

In addition to these basic pumping advantages, the improved IMO gives you important new benefits shown in the cutaway illustration below.

DE LAVAL IMO PUMPS can also be used as hydraulic motors.



Inlet can be rotated to suit installation arrangement.

Discharge flanges are infinitely varied. You can use the most advantageous piping method to suit installation requirements.

Designed for either conventional packing or mechanical seals. Sealing method may be changed in your plant with a simple kit.

Nodular iron castings for high pressure service have high shock capacity.

Any position mounting is possible without factory modification.

Higher pressure units are built by adding idler rotor and housing sections to the low pressure design. Parts for the same rotor size are interchangeable over the entire pressure range.

Internal parts are designed as a package so that units can be built into your machines.

Bulletin 3001 gives data on improved De Laval IMO pumps. Send for your copy today.

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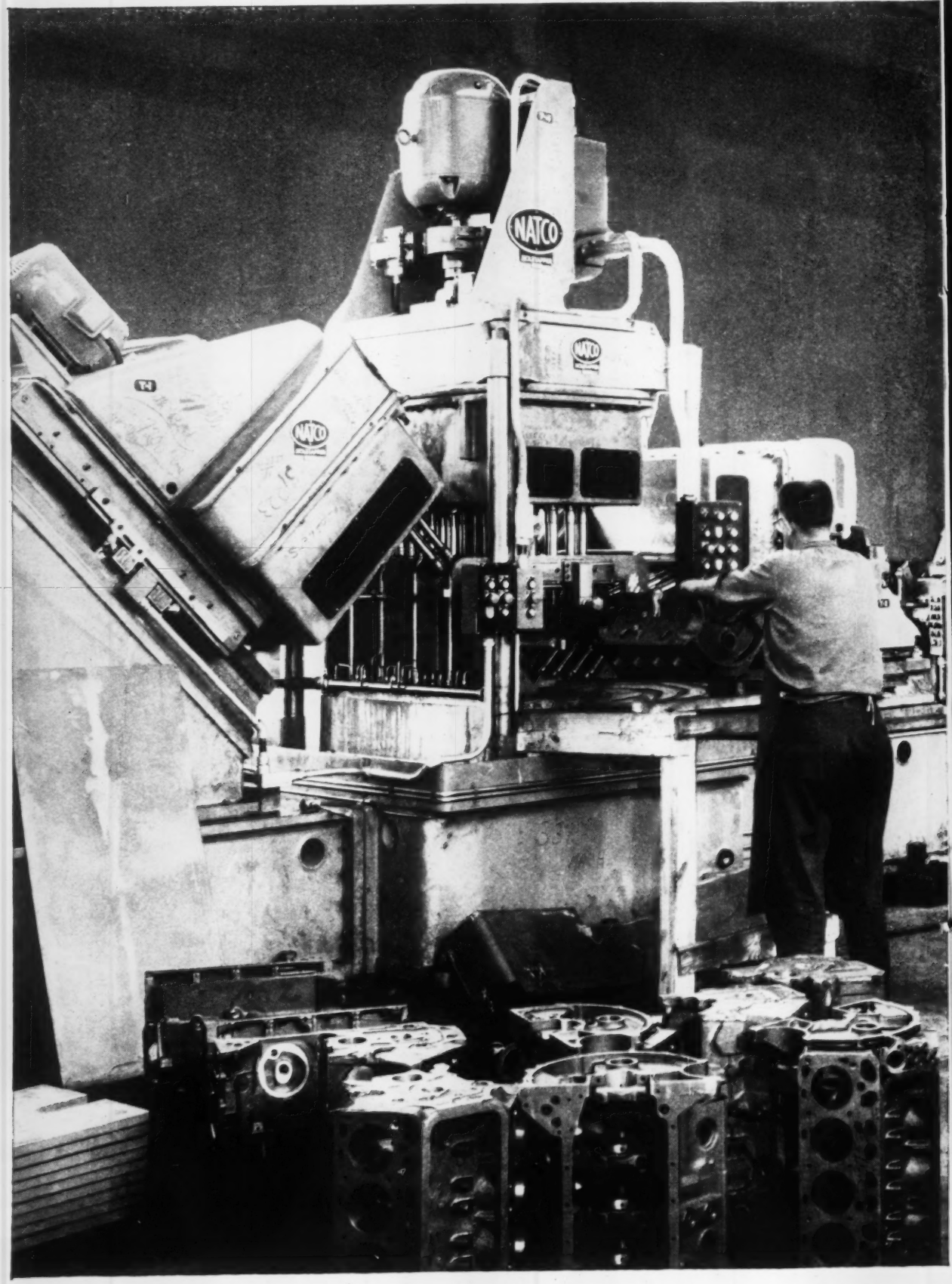
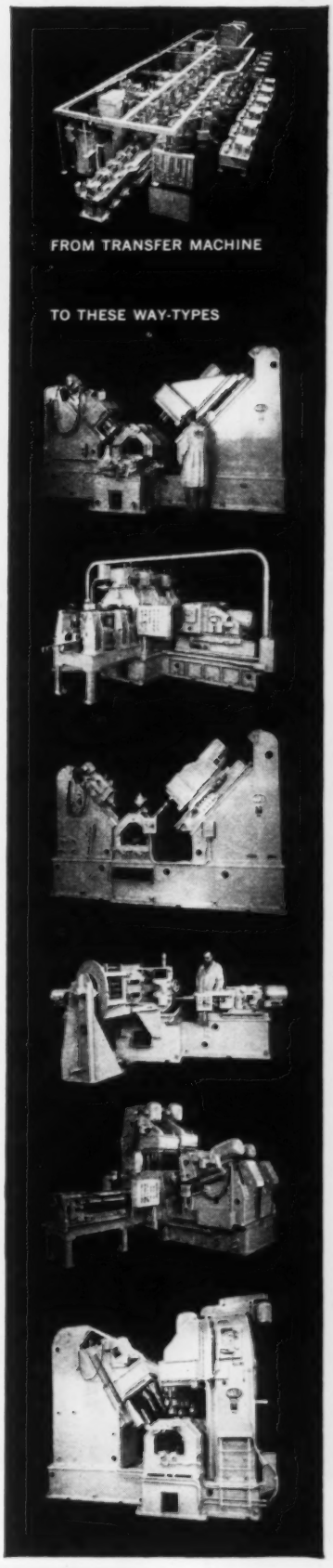

NATCO

Must your transfer machine go to scrap every time your model changes?



Certainly not. For example, the way-type machines shown here were once stations in an automated straight-line transfer machine. Now they will begin their second life as individual machines on a shorter-run lower-production assignment.

Each station in your Natco transfer machine—whether drilling, boring, milling, sawing or chamfering—is a machine tool in its own right. With modifications and new tooling, it may serve you for many years beyond its original "single-purpose" life.

When product changes call for new tooling, consider adapting the previous machinery to a new use—and realize substantial savings. Natco engineers and manufacturing facilities are at your disposal to make the necessary modifications. Call your nearby Natco representative today to discuss converting your equipment.

NATCO

Multiple-spindle drilling, boring, facing and tapping machines. Special machines for automatic production.

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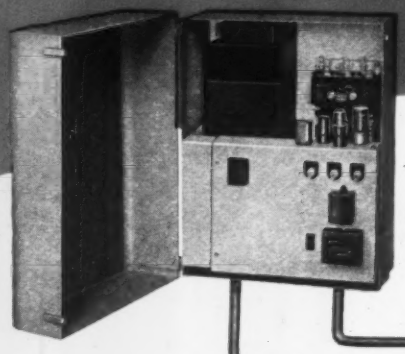
Drive Package Provides Infinitely Adjustable Speeds from AC Power Source



CONTROL PANEL

CONTROL STATION

The complete Dynamatic power package includes all components required to provide infinitely adjustable speeds from an alternating current power source. A Dynamatic Ajusto-Spede® or Dynaspede® Drive, with electronic control and pushbutton station, satisfies the requirements of almost any application where proper machine operation or material processing depends upon control of operating speeds.

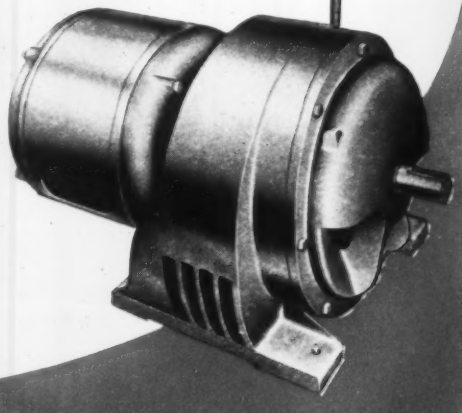
The compact control panel may be remotely mounted to conserve valuable space on the driven machine. The pushbutton station at the operator's position puts vital controls conveniently at the operator's fingertips and requires a minimum of space.

Speeds are infinitely adjustable from 0 RPM to full output speed, and accurate speed regulation may be obtained from 100 RPM to full output speed.

Ajusto-Spede® Drives, available in ratings of ¼ horsepower to 75 horsepower, are air-cooled. Dynaspede® Drives, rated from 3 to 75 horsepower, are liquid-cooled. Raise your productive efficiency with Dynamatic eddy-current units.

DYNAMATIC®

AJUSTO-SPEDE DRIVE



Send for Illustrated Literature Describing Dynamatic Adjustable Speed Drives

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F9700* SERIES 2-TONE — Latest Ful-Vue Spectacle Type addition to a line combining the finest in safety values and smart good looks — another example of how AO's continuous research and engineering pays off. The attractiveness of these onyx on crystal acetate glasses is apparent but we cannot overemphasize that they are *true safety standard* in every respect — with safety hardened lenses and safety frames etc. Light, strong and durable, they protect against frontal foreign particle impact. Also ideal for chemical and physics lab work, electrical and other operations where sparks may cause fire or explosion. Comfort cable or spatula temples. The AO plaque on the frame means a true safety frame.

*FX9700 with adjustable nose pads

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3 GREAT LINES OF AO "ULTRASCOPIC" SAFETY GLASSES

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*FX9500 model with adjustable nose pads.

NOTE: All 3 lines are available with clear or Calobar lenses (the latter for protection against glare, heat, ultraviolet and infrared hazards as well as impact). All lines feature engineered eyewire design with a deep groove to hold lenses securely and safely on impact . . . and many other features.

YOUR NEAREST AO SAFETY PRODUCTS REPRESENTATIVE CAN SUPPLY YOU.

Always insist on the AO Trademark on lenses and frames

American Optical COMPANY
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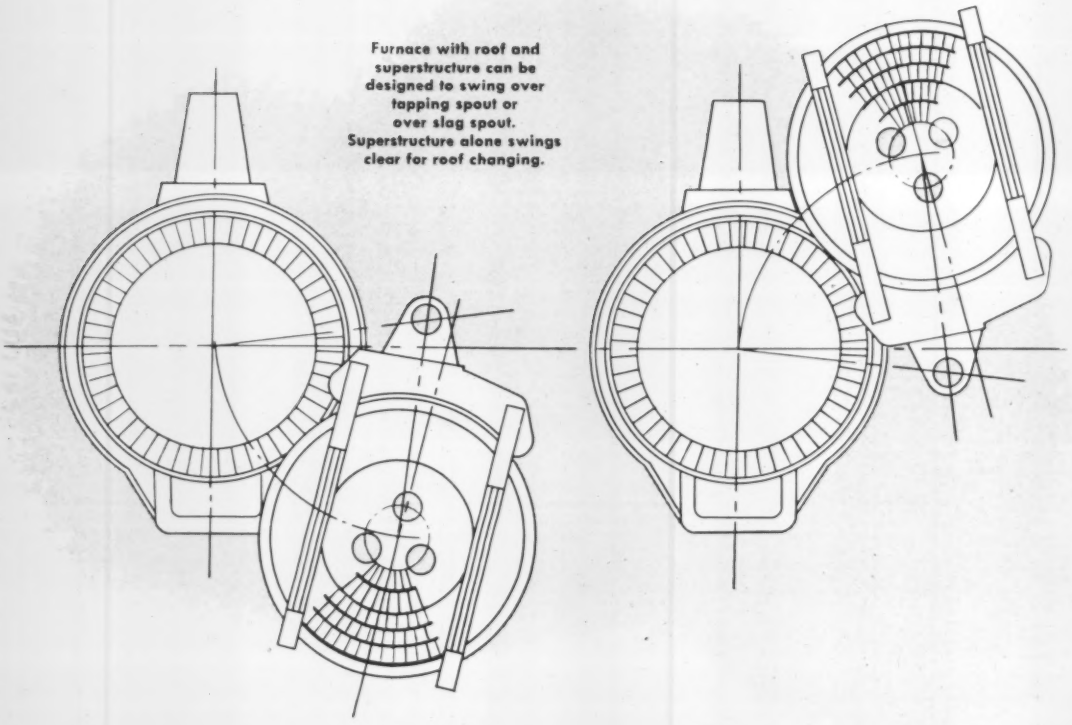


Furnace with roof and superstructure can be designed to swing over tapping spout or over slag spout. Superstructure alone swings clear for roof changing.

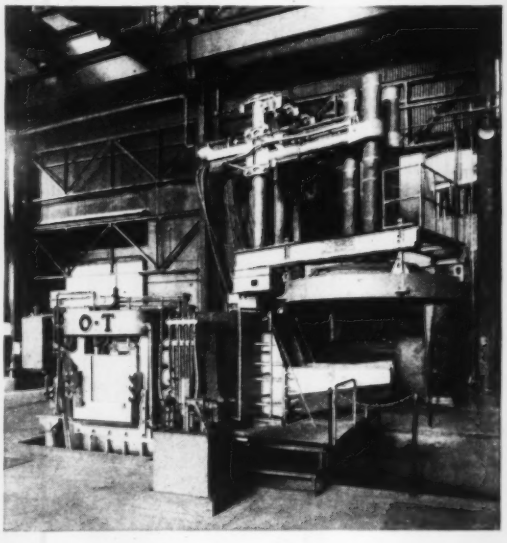
With a Lectromelt Furnace you have a choice

THE ROOF CAN BE BUILT FOR FRONT OR BACK SWING

SELECT the direction of swing that best fits your plant layout—over the tapping spout or over the slag spout. Lectromelt's design and method of separately supporting the roof structure makes this possible. You profit by the greater efficiency and convenience that result.

Note in the above drawing how the furnace top swings clear of the furnace; there's no interference with the charging bucket to slow down the charging operation. Lectromelt places the pivot point away from the furnace shell to accomplish this. And, because the swing of the top can be less, there's less strain on the conductors.

Catalog No. 10 describes Lectromelt furnaces. For a copy write Lectromelt Furnace Division, McGraw-Edison Company, 323 32nd Street, Pittsburgh 30, Pennsylvania.



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STANDARD SIZES UP TO TWO HUNDRED TONS CAPACITY

A New Grit Pattern from "Abrasive Tech"

Polishing radii of steel machinist hammers with 3" x 120" new 91 Coat RESINALL METALITE Cloth Belts jumped production.

Production News for the tough jobs —91 Coat Resinall Metalite Belts!

It's the hardest working, fast cutting abrasive in the metalworking industry. You can actually *see* the difference . . . 91 Coat is so outstanding, so much rougher and sharper. For more production, more mileage per belt . . . try 91 coat abrasives on your toughest jobs. Write for a demonstration in your plant or at your nearest Abrasive Tech Methods Room.

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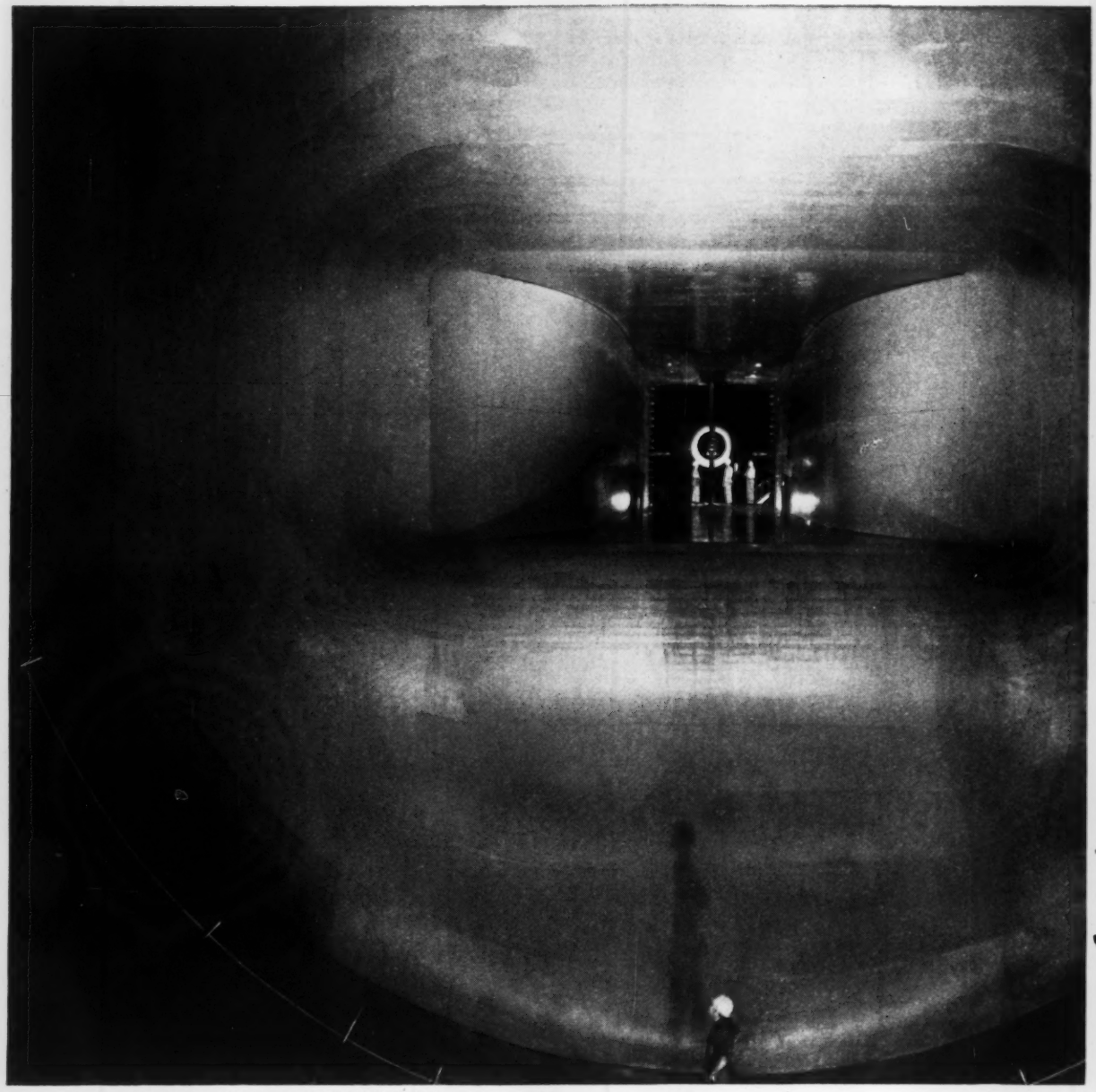

STEEL + PLUS IN ACTION: FACILITIES

You could run a two-lane highway through this steel wind tunnel at the U. S. Air Force's Arnold Engineering Development Center, Tullahoma, Tennessee. One of the biggest in the world, it's used to test full-size jet engines and large models of aircraft and missiles under simulated flight conditions. U. S. Steel played a major role in building and equipping this vital research center . . . with special steels developed by USS. *USS is a registered trademark*

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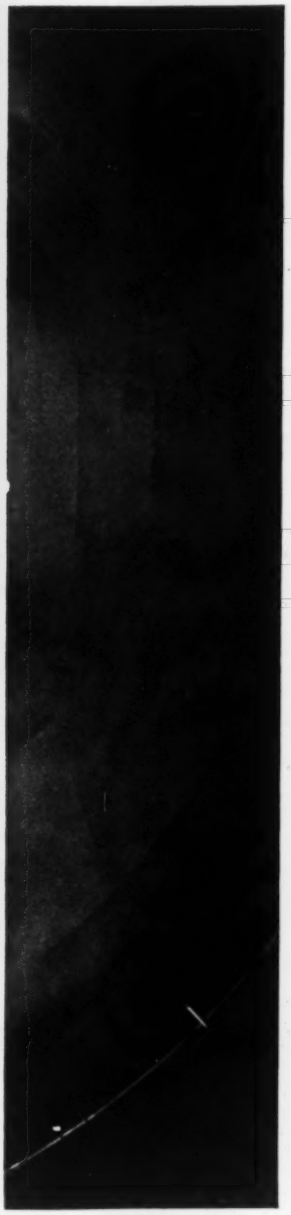
you get STEEL + PLUS



STEEL + PLUS IN ACTION: RESEARCH

What in the world will touch the moon first? It looks now like it might well be a type of steel similar to that recently developed in U. S. Steel's research laboratories. It's called USS-12 MoV Stainless Steel. Exceptionally strong (225,000 psi), it's ideally suited for the skin of missiles and rockets because it retains high strength even under the fierce heat of unearthly speeds.

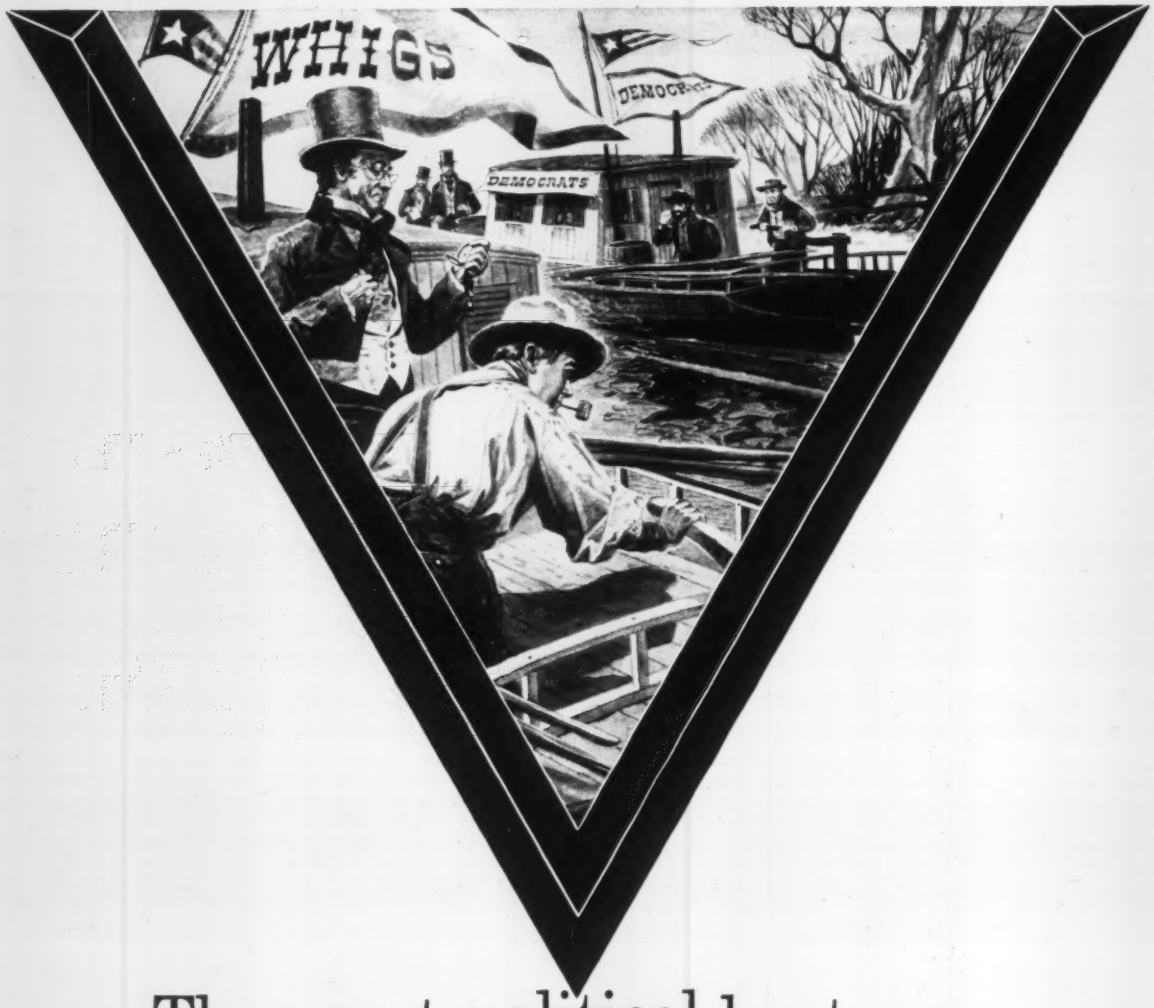
STEEL + PLUS IN ACTION: TECHNICAL ASSISTANCE

Sometimes a steel is *too* good for the job. A USS customer was glad to find that out recently when he ordered a premium-priced steel to make into shock absorber caps. A USS metallurgist studied the customer's specifications for the steel and realized that our regular hot-rolled commercial-quality steel would do the job just as well. He recommended the less expensive steel. The customer tried it and found it completely satisfactory, effecting a worthwhile saving.

STEEL + PLUS IN ACTION: MARKETING ASSISTANCE

Go back ten years and try to think of the building that did not have walls of wood, brick, glass, or stone. Now look at your city—and count the new buildings with colorful curtain walls of steel. Like all new ideas, curtain wall construction calls for a wealth of new concepts, technical data (and not a little "hard selling"), so USS engineers and market specialists make frequent calls on the men who influence the construction of new buildings. Result: more business for our customers who make steel curtain wall building components.

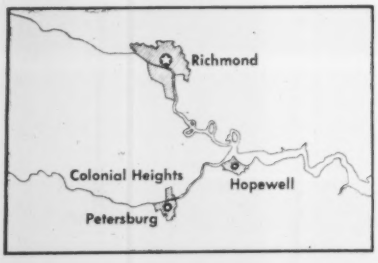
USS **United States Steel**



The great political boat race

it started something for your new plant

RICHMOND
PETERSBURG
HOPEWELL
COLONIAL HEIGHTS
VIRGINIA



Like a pair of racing turtles, two lumbering canal boats headed west from Richmond that December day in 1840. One backed by Whigs, the other by Democrats . . . each determined to be first over the 146 miles of newly extended James River Canal. The race proved prophetic. The Whig boat, *William Henry Harrison* won . . . as did Harrison himself that very Fall!

Today, over the old canal route runs one of five mainline railroads to serve your plant in the Richmond-Petersburg-Hopewell triangle. In addition, you have 56 truck lines, five major airlines, plus deep-water ocean shipping.

Your products move overnight to New York, Atlanta or Cincinnati. Yet you enjoy such Southern advantages as conservative manpower, mild climate, friendly government. And you draw electric power aplenty from Vepco's growing network . . . with 640,000 kilowatts of added capability now building, to reach a total of 2,171,900 kw in 1960. For more facts and confidential site-finding help, write, wire or phone Vepco . . . serving the "Top of the South" in Virginia, West Virginia and North Carolina.

VIRGINIA ELECTRIC and POWER COMPANY

Clark P. Spellman, Director—Area Development, Electric Building, Richmond 9, Virginia • Phone: MIlton 9-1411

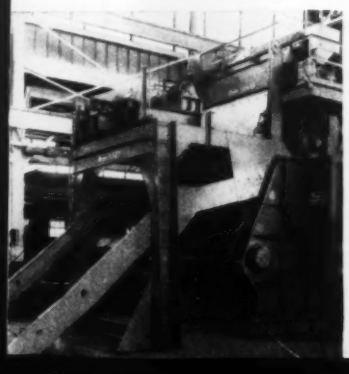
When this door comes down . . . so does your blast cleaning cost!

Abrasive-tight door on Rotoblast Barrel slashes "lost abrasive" costs

Look at it. That door on the Pangborn Rotoblast Barrel is engineered to prevent waste. Tough woven steel chain construction . . . laminated rubber back . . . edges that roll in mechanical labyrinths—it has to be abrasive-tight! As a result, here is another way that Pangborn Rotoblast Barrels save you money.

This door is just one of the many benefits built into Rotoblast Barrels. Efficient Rotoblast operation, for example. Automatic control. Ease of maintenance. Plus specific construction features that all add up to *better* cleaning in *less* time for *lowest* cost per ton.

Pangborn Rotoblast Barrel for efficient batch cleaning. Available in 1½, 3, 6, 12, 18, 20, 32, 72 and 102 cubic foot sizes.



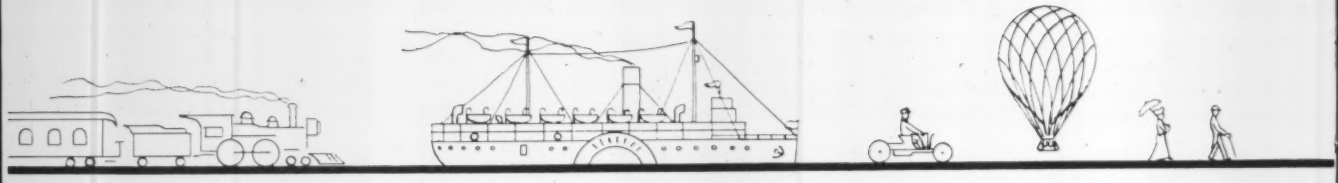
The Pangborn Engineer in your area will be glad to take off his coat and go to work on your cleaning problem at no obligation. And for complete information on Rotoblast Barrels, write to: Pangborn Corp., *1600 Pangborn Blvd., Hagerstown, Md. Manufacturers of Blast Cleaning & Dust Control Equipment.*

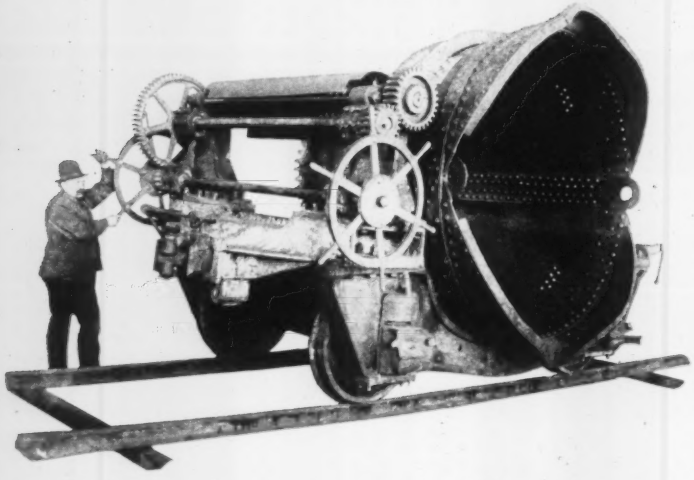
Clean it fast with Pangborn ROTOBLAST®

1902 – 25 tons per open hearth heat

1957 – 550 tons per open hearth heat

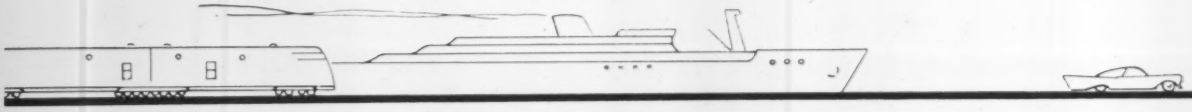
POLLOCK FEEDS HUNGRY OPEN HEARTHS

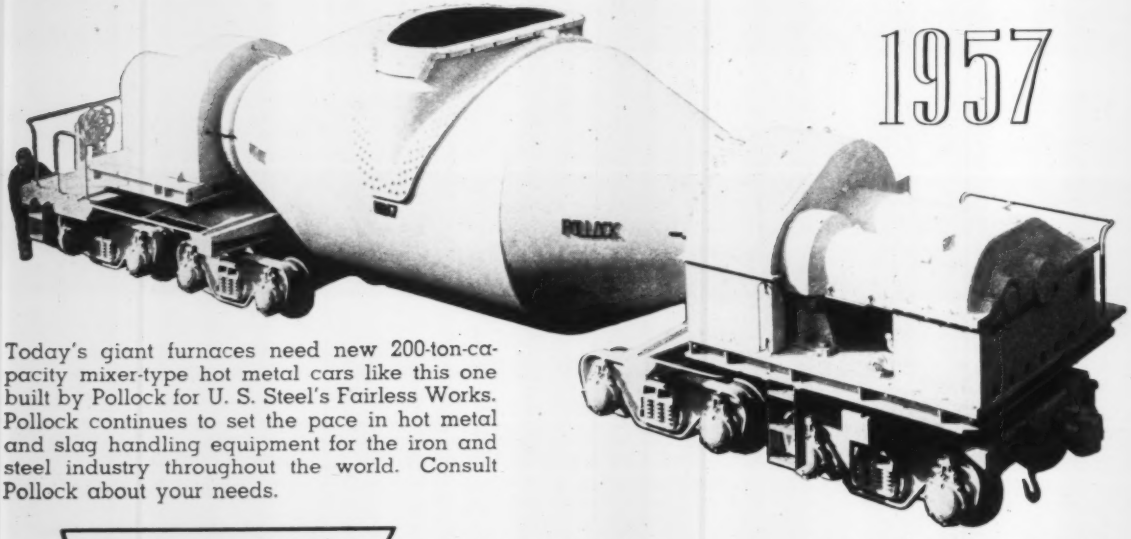




1902

Pigs went to market faster after Pollock designed and built this first 20-ton hot metal car. It was the first of thousands of hot metal cars built by Pollock.





1957

Today's giant furnaces need new 200-ton-capacity mixer-type hot metal cars like this one built by Pollock for U. S. Steel's Fairless Works. Pollock continues to set the pace in hot metal and slag handling equipment for the iron and steel industry throughout the world. Consult Pollock about your needs.

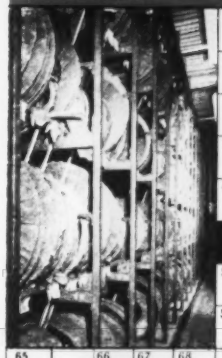
POLLOCK
SINCE 1863

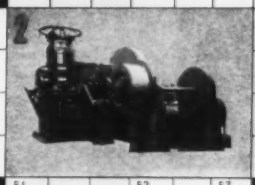
THE WILLIAM B. POLLOCK COMPANY
YOUNGSTOWN, OHIO

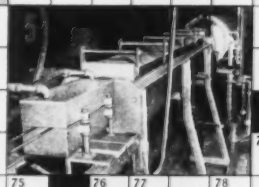
STEEL PLATE CONSTRUCTION • ENGINEERS • FABRICATORS • ERECTORS

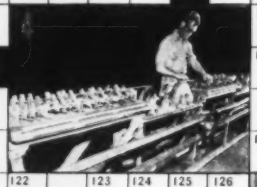
BLAST FURNACES • HOT METAL CARS AND LADLES • CINDER AND SLAG CARS • INGOT MOULD CARS • CHARGING BOX CARS • WELDED OPEN HEARTH LADLES

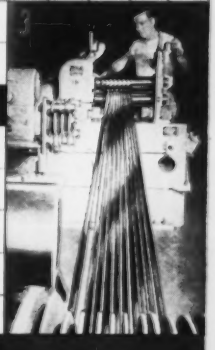
SANDVIK Clues To The Solution Of Your SPRING STEEL PUZZLES











The pictures above give you some strong hints of Sandvik's ability to supply *exact* answers to your spring steel requirements.

Here's what they represent:

1. EXTENSIVE STOCKS OF SPECIALIZED STRIP STEELS – Cold-rolled annealed, unannealed or hardened and tempered, high carbon and alloy strip – in a wide variety of sizes, tempers and special analyses to fit specific performance demands.
2. ROLLING MILLS – To roll to order the precise gauge you require, if it's not available from stock.
3. SLITTERS – To tailor strip widths to your specifications.
4. EDGE FILING EQUIPMENT – To provide the edge finish required . . . square, round or dressed.
5. HARDENING & TEMPERING FURNACES – To give the proper degree of hardness and flexibility to the strip.
6. QUALITY CONTROL – To give a continuing assurance that Sandvik's high quality standards will be consistently maintained.

With these extraordinary facilities, Sandvik can supply the exact size and type of steel . . . either off-the-shelf or tailored-to-order . . . to suit almost any spring steel requirement.

For specific information contact your nearest Sandvik office.

SANDVIK STEEL, INC., 1702 NEVINS ROAD, FAIR LAWN, NEW JERSEY

Tel. [illegible] to N. Y. C.

Warehouses: Fair Lawn, N. J. • Cleveland • Los Angeles

Branch Offices: Cleveland • Detroit • Chicago • Los Angeles

SANDVIK CANADIAN LTD. P. O. Drawer 1330, Sta. O., Montreal 9, P. Q.

WORKS: Sandviken, Sweden

OTHER SANDVIK PRODUCTS: Power Springs, Coromant Carbide Tools, Sandvik Steel Belt Conveyors, Sandvik Hand Saws and Tools

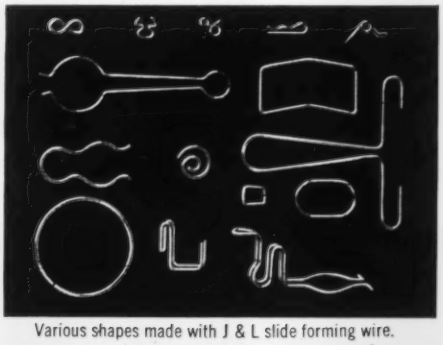
Quality products start with J&L stainless steel wire

Long-lasting filters and screens are woven from stainless steel wire.

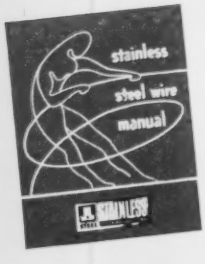
Many types of screws are more economically formed by cold heading.

Many types of products are fabricated from stainless steel wire. We suggest you consider Jones & Laughlin Stainless Steel Wire where ease of forming or special corrosion or heat resisting properties are required.

For *your* particular application or production problem, we offer the services of our stainless steel specialists. A letter or call will receive prompt attention.



Various shapes made with J & L slide forming wire.



Wire today for your copy of J & L's new Stainless Steel Wire Manual.

Improve your Products with . . .
J&L STEEL STAINLESS
BAR • WIRE • SHEET • STRIP

Jones & Laughlin Steel Corporation • STAINLESS STEEL DIVISION • Box 4606, Detroit 34

COOPERATION . . .

THE STORY BEHIND THE GREENLEE MACHINE

Production difficulties with hydraulic steering gear housings sparked a bold, new idea . . . an automatic transfer machine capable of performing 114 machining operations to close tolerances on rough castings, at the rate of more than 200 pieces per hour. These production problems were:

1. Maintenance and expense.
2. Locating on a rough casting.
3. Marring finished surfaces.
4. High percentage of scrap.

Any new production method must solve these problems and show savings to justify the investment in new machinery.

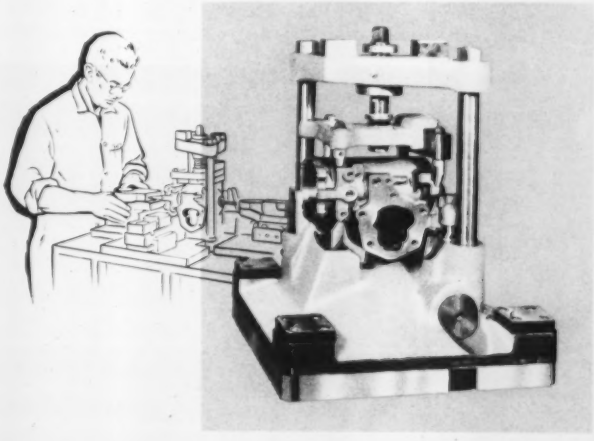
These problems were discussed during a meeting with the customer. Greenlee sales engineers made a careful, complete study of the problems and prepared a machine proposal sketch, a wooden model of the work holding pallet, and a firm price for the recommended equipment.

Meetings were held at Rockford and at the customer's plant where management, production, tooling and inspection people . . . engineers from both companies, who were familiar with the job, participated. In addition, arrangements were made for the customer to visit other plants where Greenlee machines were in operation. These visits enabled them to see operations similar to the ones required on the proposed machine.

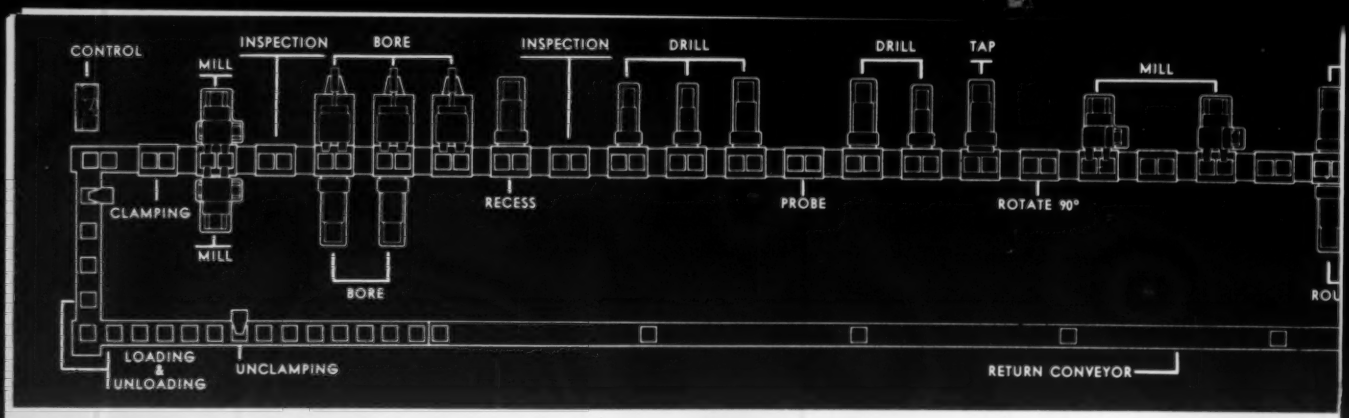
Operations studied included the handling of chips and coolant, foundation design, gauging on the machine, tool grinding, use of pre-set tools and tool control boards, and accuracy of Greenlee machines after years of continuous use. Specific machining operations were also studied on transfer machines similar to the one being planned.

After all of these factors had been carefully analyzed by the customer, the Greenlee proposal was approved.

The machine was designed to handle the rough casting in a work holding fixture or pallet. Once located and clamped in the pallet, the housing is completely machined before being released. All machining operations are performed in proper relation to each other, and any tendency to mar finished surfaces is eliminated.



GREENLEE BROS. & CO. ROCKFORD, ILLINOIS, U.S.A.



A walking-beam type of transfer mechanism was used to carry the pallet from station to station. Thus the clamping pads and locating bushings of the pallet would be kept clean and free from burrs or chips. These critical surfaces are never touched by the transfer bars or anything else except the mating clamp pads and locating pins which enter the bushing at the work station. The castings are machined two at a time until they reach the last machining section where they are finish bored four at a time.

The pallets then enter the return conveyor one at a time where a number of de-burring operations are performed. Finally they transfer through a two stage flushing and blow-off unit where pallets and castings are cleaned before their rapid-return to the head of the machine for automatic unclamping.

The machine itself is of the usual Greenlee Rearrangeable Unit design to facilitate shipping and installation, and to take care of possible future engineering changes and improvements in design of the part.

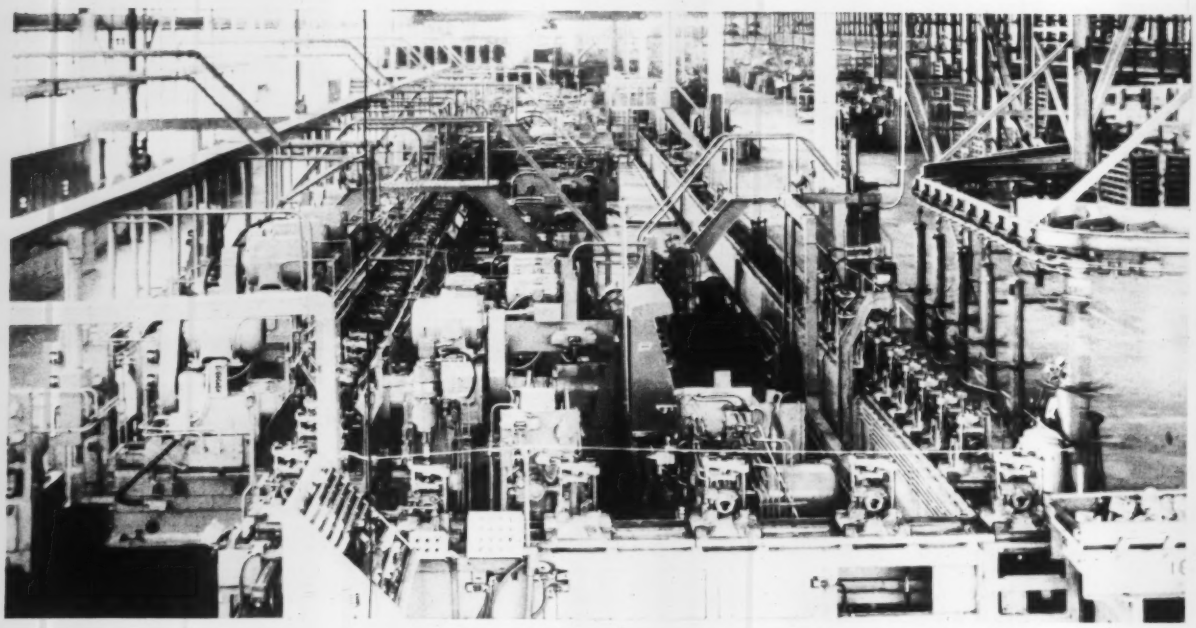
Thus, proper design of the machine and the closely coordinated details of tooling and installation *SOLVED THE FIRST PRODUCTION PROBLEM.* Use of pallets for locating and holding the castings *SOLVED THE LAST THREE PRODUCTION PROBLEMS.*

Throughout the design and building period, details were checked carefully with the customer's tool engineers, production people, inspectors, maintenance and plant engineers. During the final stages of assembly and testing in the Greenlee plant at Rockford, these people were thoroughly schooled in technical details of the machine.

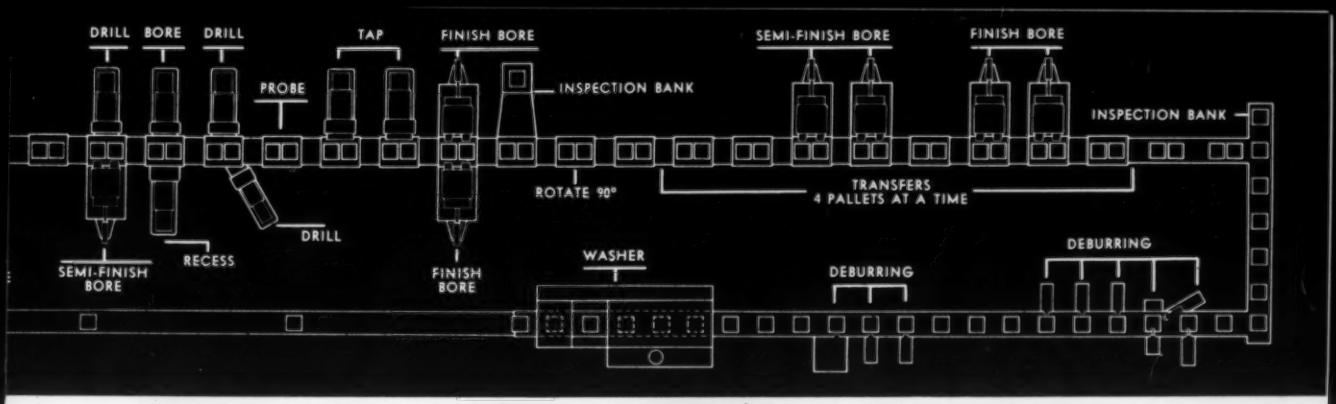
Following successful test runs, the machine was dismantled and shipped. The first of 21 truck loads left the Greenlee plant on a Tuesday morning — the last one Friday. The next Monday evening . . . six days after the first shipment . . . the machine was automatically cycled in the customer's plant and put into production. Cooperation between experienced Greenlee supervisory personnel and customer's men made this record possible.

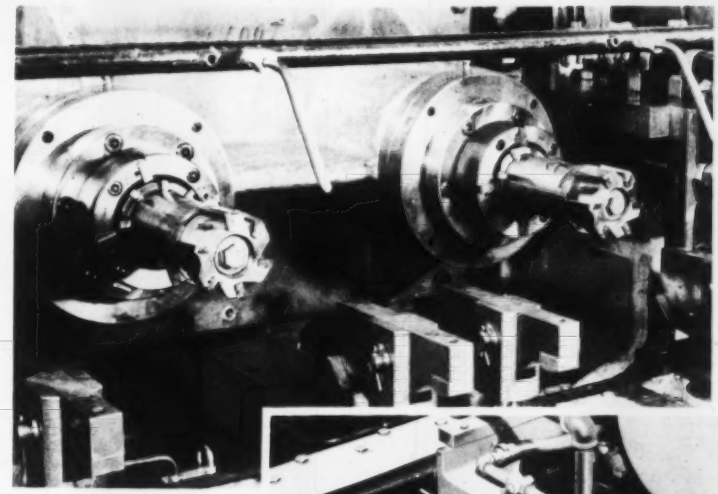
This is the story behind the machine . . . a story that began with a production problem . . . a problem that has been successfully solved by the intelligent cooperation of the men who represent the machine builder and the machine user . . . cooperation that made it possible to produce parts to close tolerances at the required production rate with a minimum of maintenance and expense.

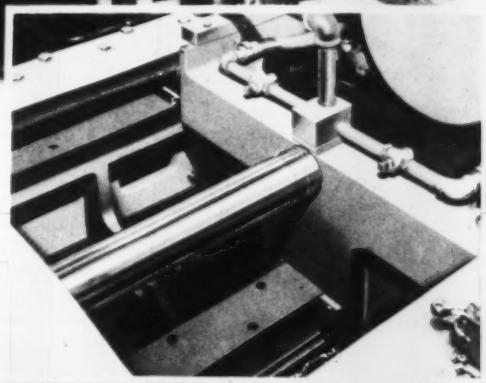
GREENLEE

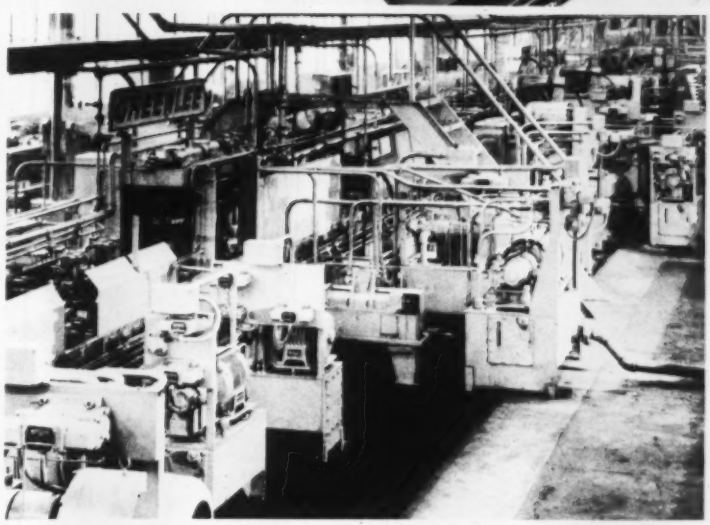


The rough casting is machined wet on this 128 station, 225 ft. Greenlee palletized transfer machine. The machine is completely automatic with all operations synchronized. One operator handles the loading operation and controls all functions of the machine. The electrical control panel and system of lights locates immediately any trouble throughout the system. All hydraulic units conform to the J.I.C. standards for easy maintenance. An automatic lubricating system provides the correct amount of lubrication to the ways and moving parts.









BORING ACCURACY ASSURED: Hydraulic steering gear housings call for a high degree of accuracy in the cylinder bore and pitman shaft hole. To maintain the accuracy, to increase tool life, and make pre-set tooling possible it was decided to use multiple blade boring tools.

Greenlee boring slides of massive construction were used to properly support the boring tools. Tool life, accuracy and surface finish on the $3\frac{1}{2}$ dia. x 7″ deep cylinder bore and the important pitman shaft hole have been far better than all estimates.

AUTOMATION: Both the machine and the conveyor are entirely automatic and completely interlocked for safety.

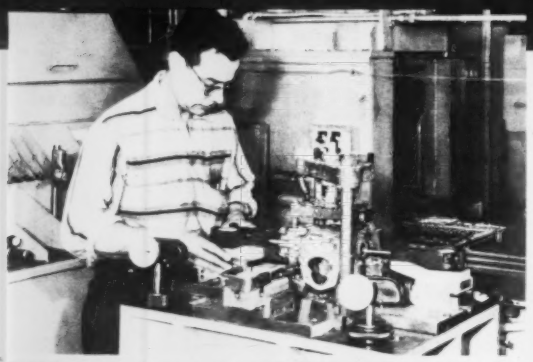
Failure of any unit or sequence will immediately prevent the machine from cycling. An emergency cord on each side of the machine runs its full length. When this cord is pulled, all heads withdraw 1/16″ and stop, preventing the possibility of tool damage.

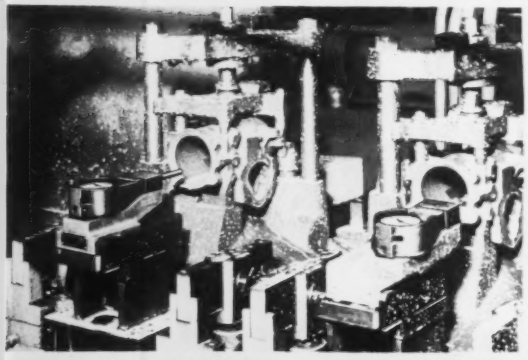
The machine operator removes finished parts and places rough castings in the unclamped pallet. Locating of the part in the pallet, clamping and unclamping is automatic.

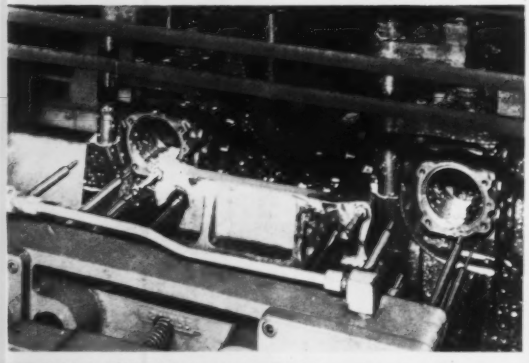
INSTALLATION: Machine is placed on a reinforced concrete foundation designed to maintain cleanliness and avoid a wet deck. It has a built-in conveyor which carries the chips and coolant to an automatic reclaiming unit. The filtered coolant is returned to the system and the dry chips are blown outside into a railroad gondola. More than 700 GPM of coolant and a quarter ton of chips are processed hourly.

GREENLEE BROS. & CO.

ROCKFORD, ILLINOIS, U.S.A.







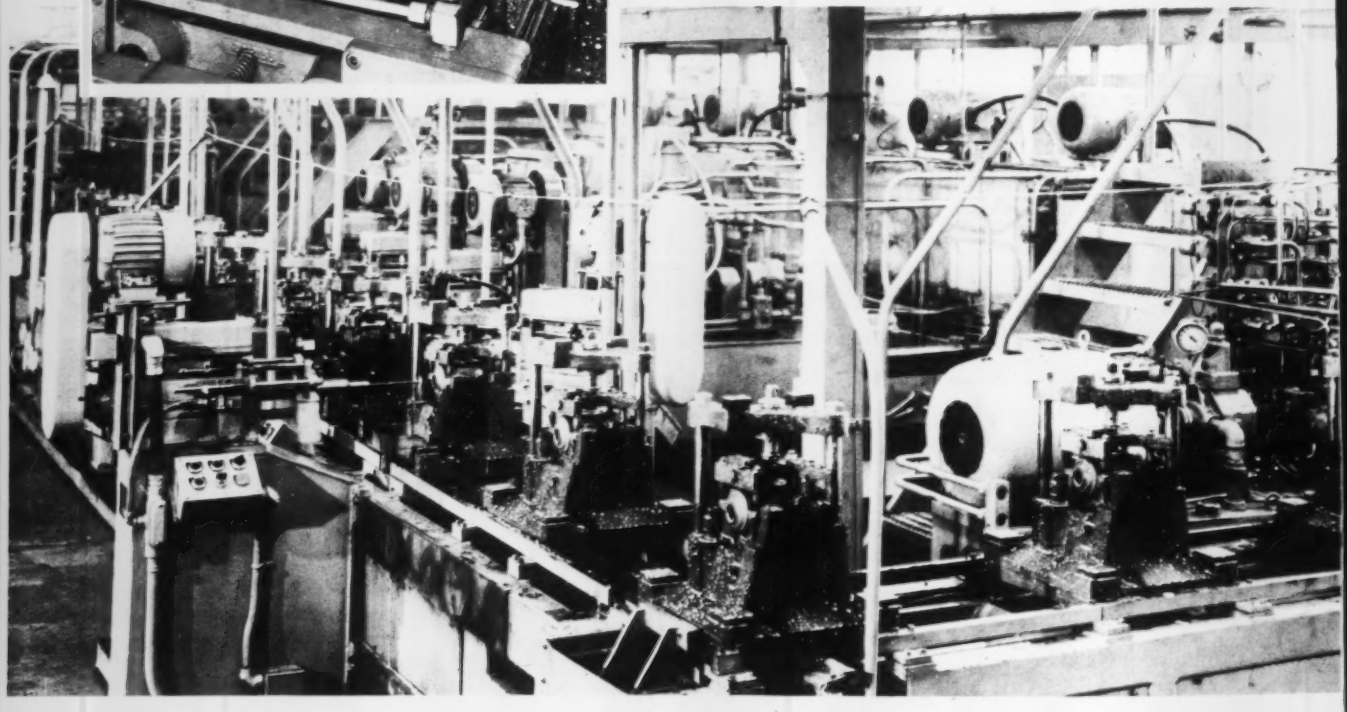
INSPECTION: Idle stations provided at intervals the length of the machine are used for both gauging and visual inspection.

In addition, at Stations 31 and 44 provision was made for the removal of pallets onto an inspection bank where more detailed inspection operations can be performed at regular intervals making certain of rigid quality control. During inspections, the machine continues to produce at the normal rate.

DEBURRING UNIT: Hydraulic devices must be absolutely free from all foreign matter. Deburring is an important and precise operation. Twelve stations were provided in the return conveyor where the pallet is located and clamped providing space for several automatic, and one hand burring operation. These include the deburring of drilled holes, corner breaking on cylinder bores and an emery cloth operation on finished faces. Deburring units are interlocked with the machine and conveyor.

FLEXIBILITY: Flexibility of operation is designed into the machine. Re-arrangeable unit construction and idle stations fitted with locating and clamping fixtures will make it possible to adapt the machine to a radically different housing at a fraction of the original cost.

PRODUCTION MACHINERY
GREENLEE



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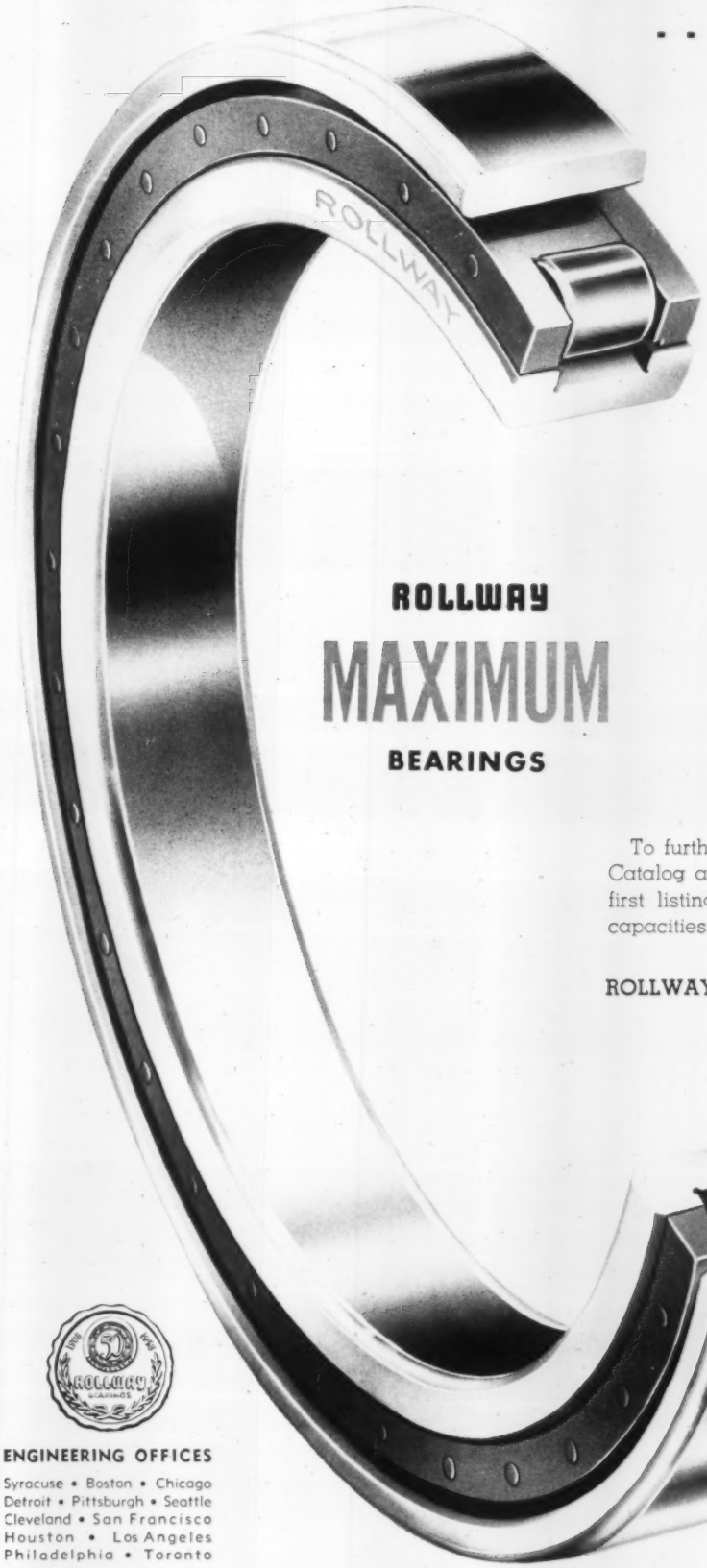

. . . performance beyond the usual . . .

Design of high-speed precision machinery often calls for bearings which offer the utmost in load capacity, "hot hardness", dimensional stability. Each machine presents its own exacting requirements.

Fulfillment of unusual requirement combinations is a specialty at Rollway. Your selection of exactly the right precision radial cylindrical roller bearing is assured by:

- **A broad range of types and sizes, numbered in the thousands**
- **Retainers of standard bronze or "Rollube" ferrous alloy, in roller-riding, land-riding, or broached construction**
- **Crowned rollers**
- **Modification of any factor to meet your application**

To further implement your choice, the Rollway Catalog and Engineering Data Book contains the first listing, by any manufacturer, of the thrust capacities of cylindrical radial roller bearings.

ROLLWAY BEARING CO., Inc., Syracuse 1, N. Y.

ROLLWAY

MAXIMUM

BEARINGS

ENGINEERING OFFICES

Syracuse • Boston • Chicago
Detroit • Pittsburgh • Seattle
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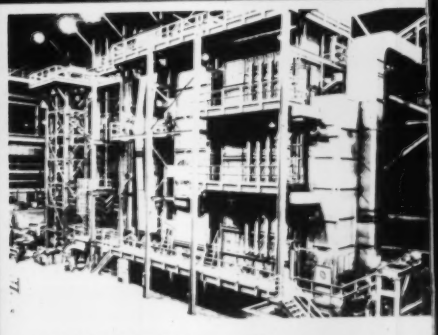
HEAT



1. GAS/ELECTRIC tower furnace uses economical coke-oven gas.

. . . ENGINEERED BY GENERAL ELECTRIC ASSURES YOU LOWEST-COST HEAT SOURCE

A complete line of electric and gas-fired furnaces and induction heaters enables General Electric's qualified Heating Specialists to give you an unbiased solution to your heat treating problems.

Because General Electric supplies all types of Industrial Heating equipment including gas-fired and electric furnaces, induction heating units, and protective atmosphere producers and control, they can tailor a heat treating system for you which best meets your requirements. You get low first cost and low operating costs which will help pay for your system in two or three years and make substantial contributions to profit when the equipment is paid for.

Here are four examples of results achieved through heat systems engineered by General Electric (pictured below):

1. **EXTRA ECONOMY** is achieved by using coke-oven gas, a by-product of other manufacturing processes, in the gas-fired heat-up section of this new General Electric tin-plate annealing furnace. Electric heat is used to achieve close control of the holding and cooling sections.

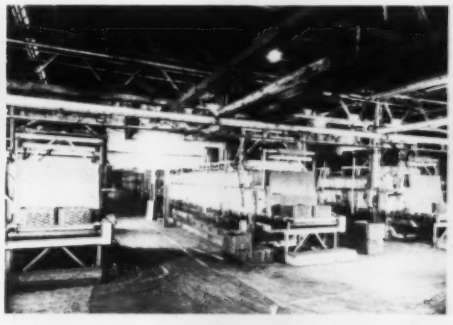
2. **ADDING SUPPLEMENTARY BATCH FURNACE** capacity to handle special loads of copper wire at lower cost, this manufacturer found that gas was now his best buy, so he chose a General Electric gas-fired cylindrical bell furnace and endothermic gas atmosphere producer.

3. **REPLACING OIL-FIRED BATCH FURNACES** with two continuous G-E electric roller hearth furnaces, a Midwest foundry cut its cycle from 4 days to 48 hours, cut man hours by 40%. They report a 35% return on investment and have recently added a third General Electric furnace of the same type.

4. **SCRAP LOSSES WERE CUT FROM 35% TO 2%** with a G-E electronic induction heater used for brazing electric-switch housing and jet engine components. Resultant savings in manpower, materials and machine time have helped pay for the General Electric installation. Higher quality products are produced.

YOU CAN ACHIEVE RESULTS LIKE THESE with a heat modernization system engineered by General Electric to fit your needs. If you suspect that obsolete heat processing equipments are robbing you of profits, call your G-E Apparatus Sales Office. A qualified Heating Specialist will be glad to discuss your opportunities for potential savings and profits. Why not call today? Section 721-13, General Electric Company, Schenectady 5, New York.

2. RATE COMPARISONS showed gas furnace to be best buy.



3. ELECTRIC FURNACES cut cycle from 4 days to 48 hours, cut manhours 40%.

4. INDUCTION HEATER cut scrap losses from 35% to 2%.

GENERAL ELECTRIC

WASHBURN WIRE COMPANY NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

MORE PRESS - IN LESS SPACE - AT LOWER COST...

HPM

diaform press

H-P-M 10,800-Ton DIAFORM press.

Here's a press that's a natural for missile and aircraft production—high tonnage at low cost—economical to install—a space saver—flexible in plant layout—and the answer to tough forming jobs using aluminum, titanium and other "hard-to-form" alloys.

Here are some of the many advantages of H-P-M's new DIAFORM press: Twin table tops are flat for loading and unloading dies. Operator has easy access for hand work on parts . . . The entire table surface is a working area . . . There is practically no restriction where form blocks of various heights are placed on the table . . . It's impossible to "stick" a work loading table in the press due to misplacement of form blocks or throw pads . . . The pad facing is 6" thick — an important factor to insure conformity of the upper radii of the formed part to the radii of the form block. This results in minimum wrinkling . . . Work is raised to the level of the rubber pad rather than deforming the pad to reach the position of the work. Less deformation of the pad results in longer wear and better service.

Investigate what the H-P-M DIAFORM press will do for you. Write today.

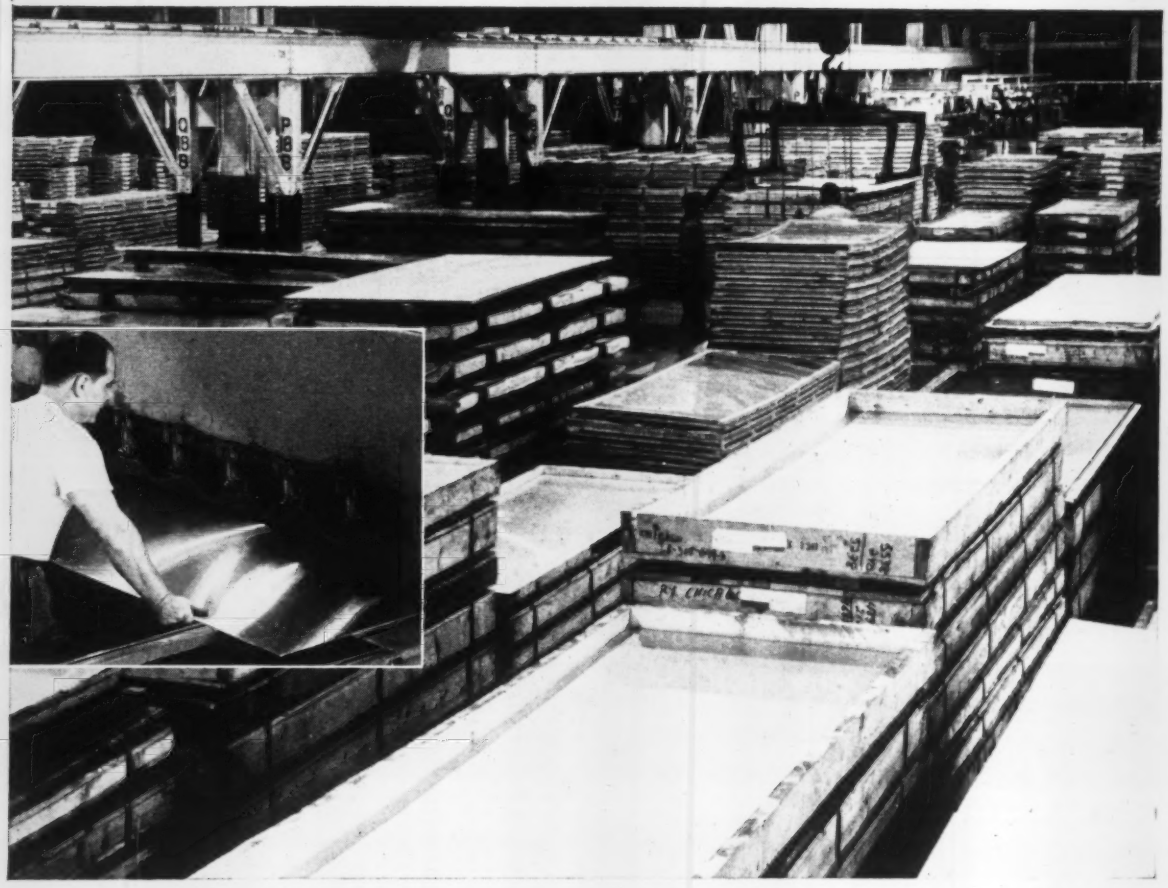
Typical irregular aircraft parts formed on the H-P-M DIAFORM press.

H834

THE HYDRAULIC PRESS MFG. COMPANY

A DIVISION OF KOEHRING COMPANY • MOUNT GILEAD, OHIO, U. S. A.

HPM



Why do more stainless buyers call Ryerson?

There are four main reasons:

First, the nation's largest stocks of Allegheny stainless are always on hand at Ryerson—2351 types, shapes, sizes and finishes . . . tons of sheets, plates, bars, angles, pipe, tubing and fittings.

Second, Ryerson knows stainless. As the pioneer supplier of stainless from stock, Ryerson has worked with more stainless users, helped more firms to use the right type to the best advantage. This experience is always available to present and future users.

Third is the equipment for cutting stainless to your specifications. The most modern shears, saws, and flame-cutting machines produce accurate sizes and shapes, in any quantity.

And fourth is Ryerson's ability to deliver any requirement, any quantity—on time.

When you need stainless, or help on stainless problems—call your nearby Ryerson plant.

RYERSON CERTIFIED QUALITY

RYERSON STEEL®

Member of the INLAND Steel Family

Principal Products: Carbon, alloy and stainless steel —tubing, bars, structurals, plates, sheets —aluminum, industrial plastics, metalworking machinery, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • INDIANAPOLIS • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

STEEL

July 14, 1958

Metalworking Outlook

Employment Prospects Improve

Employment will rise 2.2 per cent in the last half over the first half, metalworking managers tell STEEL. Job-seeking students pushed unemployment to a postwar peak of 5.4 million in mid-June, the U. S. reports, but on a seasonally adjusted basis, unemployment fell from 7.2 per cent of the labor force in mid-May to 6.8 per cent in June. Manufacturing industries shared in an employment rise for the first time after 18 months of decline. Manufacturing jobs numbered 15.2 million last month, up 150,000 from May. Gains came in the steel, metal fabricating, and electrical equipment industries.

Stocks of Autos Drop

Look for stocks of cars in dealers' hands to reach about 250,000 by Labor Day. That level can easily be managed when '59 models start coming out. Inventories were reduced 55,000 in June, 54,000 in May, and 56,000 in April. They have been cut by almost 200,000 from March's high point.

Small-Car Engine for GM?

Watch for General Motors Corp. to introduce a flat, air-cooled engine early in 1959. Castings production for the unit will begin about Dec. 1, probably at the Chevrolet foundry in Tonawanda, N. Y. The engine reportedly will have finned, cast gray iron cylinders bolted to a cast aluminum crankcase. Other aluminum castings include heads, pistons, transmission, and other housings. It sounds like the powerplant is designed for a small car, but GM isn't talking.

U. S. Studies Air Conditioner Excise

Within the next two months, you can expect the Internal Revenue Service to broaden the excise tax so that it covers all household air conditioners (both room and central). That would be a levy of 10 per cent on the units not now covered. At present, the 10 per cent excise is only on units of ¾ hp and under which account for a mere 13 per cent of industry sales. The move by IRS would add to troubles in the industry, already plagued by unexpectedly low sales in May and June because of cool weather.

Depreciation Aid for Small Firms?

Small business companies would be given a tax credit for part of the money they spend on new equipment or enlarged inventories under a proposal being considered by House tax writers. The credit would be a deduction from the firm's final tax bill, not just from the original taxable income. The tax cut would be $500 or $1000 a year depending on the type of company affected.

Big Missile Business: On the Ground

The Air Force will spend $943 million in fiscal 1959 on major ground-support items for surface-to-air missiles, estimates the Aircraft Industries Association. Through fiscal '65, spending will average about $1 billion a year (see Page

Technical Outlook—Page 111 Market Outlook—Page 153

66). Items include: 1. Missile exercisers to simulate actual flight movement. 2. Checkout benches to determine the condition of electronic components. 3. Straddle transporters to move the missile to launching sites. 4. Launcher erectors to lift the missile into firing position. 5. Jet fuel carts to service the boosters. 6. Gasoline fuelers for the ram jet engines. 7. Trailers to haul acid fuel. 8. Air and helium compressor plants, and helium storage containers, dryers, refrigeration systems, and receivers. 9. Beacon test equipment and launching control consoles. 10. Checkout vans to visit each launching shelter every six months to determine the missile's combat readiness.

Small Missile Firms in Trouble

Testifying before Rep. Tom Steed's (D., Okla.) Small Business Subcommittee, John Marschalk, executive director of the Strategic Industries Association, reported that three of the seven founding firms of SIA have been sold to larger companies "within the past few months." He cites three main troubles of small firms in defensework: 1. Renegotiation Act's penalty against profits gained by a prime through subcontracting. 2. Low rent of government-owned facilities and tools to large competitors. 3. Lack of proprietary rights on privately developed designs.

Demand for Executives Inches Upward

Demand for top executives has inched upward since hitting a three-year low in December, Heidrick & Struggles Inc., Chicago recruiting firm, reports. Aircraft and electronic openings have resumed a steady uptrend in the last six months. Marketing and finance are also holding well. Openings for executives in manufacturing, general administration, and personnel lag year-ago levels by 40 per cent or more. Base salaries for executives remain about the same as last year, but bonus payments are off substantially.

Few Salary Boosts in Steel

Some steelmakers will forego salary boosts now for their management personnel. Those include U. S. Steel Corp., Republic Steel Corp., Inland Steel Co., Jones & Laughlin Steel Corp., and Allegheny Ludlum Steel Corp. But some of the smaller companies, like Lukens Steel Co. and Atlantic Steel Co., have granted management increases commensurate with the gains that went July 1 to unionized personnel. Employees such as clerks who do fall within provisions of the federal wage and hour law, although they are not unionized, generally are getting boosts.

Straws in the Wind

International Nickel Co. of Canada Ltd. is reducing its workweek from five to four days; the independent International Union of Mine, Mill, and Smelter Workers seeks 40 hours' pay for a 32-hour week from Inco . . . The aluminum industry has the same problem as steel: Wages go up Aug. 1, but producers are still undecided about price hikes . . . United Steelworkers of America has a new worth of $32.1 million, highest in its 22-year history.

Operates MARVEL No. 8 Metal Cutting Band Saw by FEEL!

sightless operator uses saw to FULL CAPACITY!

Among the many advantages of the MARVEL No. 8 Band Saw is the simplicity and convenience of operation built into this universal metal cutting saw.

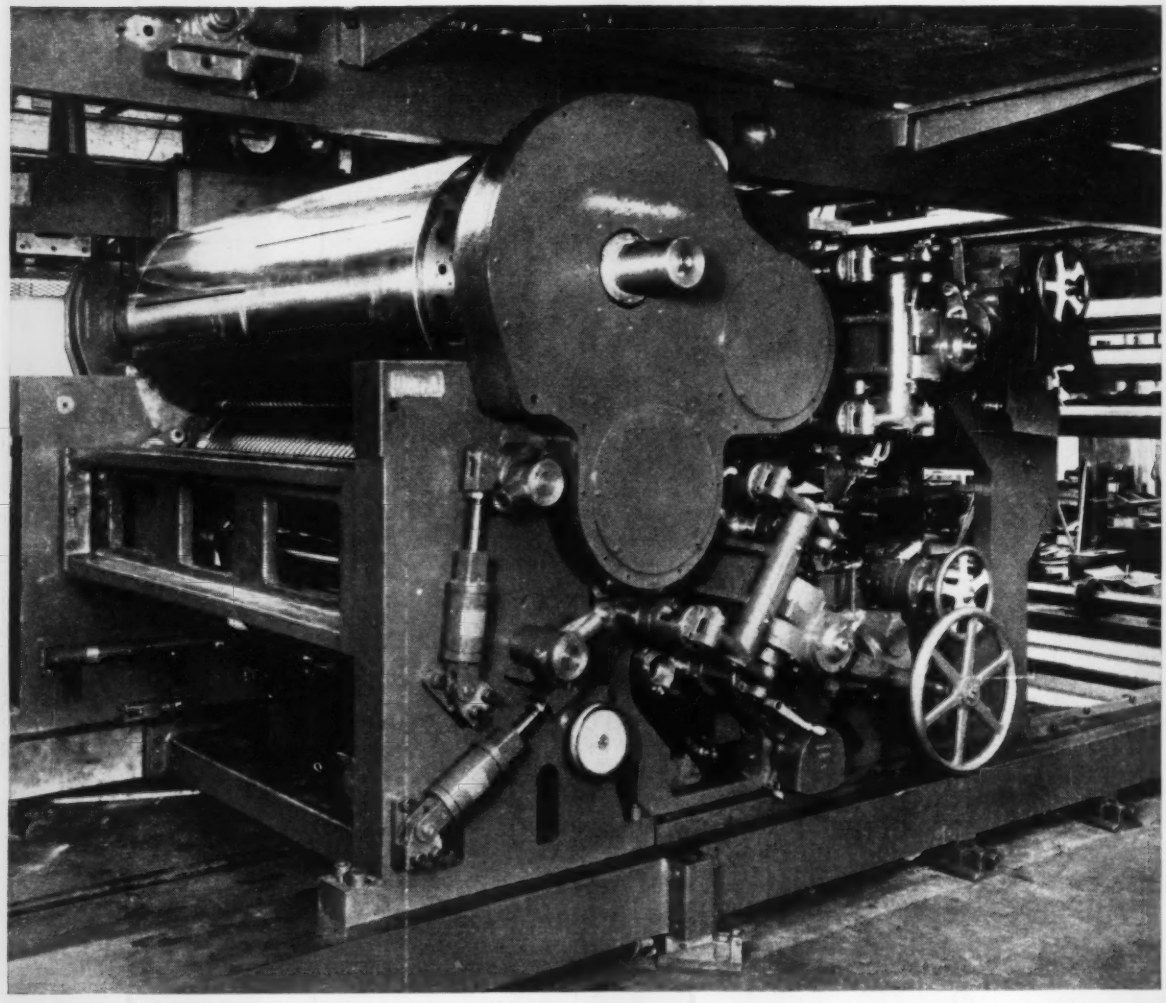
Here's a case in point. Paul Stevens, who is totally blind, is employed by the Purkett Manufacturing Co., Joplin, Mo., manufacturers of laundry equipment, as a MARVEL No. 8 Band Saw operator. He operates two MARVEL No. 8 Band Saws, filling orders from the fabricating department for bars, shapes and even mitres. He handles the entire operation without assistance from anyone.

Thoroughly familiar with his stock and bin locations, he sets up the saw, measures lengths, and turns out work accurate to $\frac{1}{32}$". Almost any conceivable sawing job is handled on these machines, from the smallest, most delicate work to heavy beams, up to 18". They will cut-off bar stock, pipe, tubing, moulding and structural shapes—saving hours of machining time.

The MARVEL No. 8 vertical column design, table height working surface, easy accessibility to simple operating controls, fast and positive power or manual feed control, column and blade tilting to any angle up to 45° right or left of vertical for cutting at an angle or mitre—are just a few design and operating features that make MARVEL No. 8 Band Saws the best all-around saw you can buy.

For the complete story, write for the new Bulletin 875, which illustrates and describes this outstanding universal metal cutting saw.

ARMSTRONG-BLUM MFG. CO.
5700 BLOOMINGDALE AVENUE, CHICAGO 39, ILLINOIS



New Babcock magazine press uses a ductile iron impression cylinder 50" diameter, 83" long. United Engineering & Foundry Company, Canton, Ohio, supplied this ductile iron casting to Babcock.

How to get castability, machinability plus strength and toughness

See the gleaming impression cylinder in the upper left section of the press? It's ductile iron.

There are six cored holes that run longitudinally close to the surface of the ductile iron cylinder that were cast within a location tolerance of $\pm 1/8$ inch!

The relative ease of producing such a casting was one of the reasons why the manufacturer selected ductile iron in preference to steel. While steel offered the required strength properties, the greater difficulty in maintaining the close dimensional control made it unattractive for this job.

And, because ductile iron combined the necessary castability and machinability with high strength and high modulus of elasticity, it was the manufacturer's natural choice over gray cast iron, too.

What about your applications? Can they use the processing and product advantages offered by ductile iron? Six types of ductile iron are available. One should suit your particular application. Tensile strengths range from 60,000 psi to 150,000 psi, with elongation ranging from 5% to more than 20%. Why not get complete information? Request your copy of "Ductile Iron Digest." Write:

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

ductile iron . . . for high strength and toughness in iron castings.

The Future Won't Wait!

July and August are traditionally the months for summer vacations and plant shutdowns.

In most years, business can ride through the summer doldrums under its own momentum.

This year, however, is different. We are in a period in which urgent action is needed to offset the usual summer lethargy.

The situation is fuzzy, difficult to analyze. These are some of the factors:

The paradox of rising wages and prices when business is slow.

The growing resistance of consumers to higher prices.

The pressure from government to keep the lid on prices and wages.

The inflationary influence of easier money and heavy deficit spending by the federal government.

The continued decline (but fortunately at a slower rate) in spending for plant and equipment.

The squeeze on profits as the spread between costs and selling prices narrows.

But out of this welter of conflicting influences is the growing belief that the recession has run its course and that the trend will be slowly upward over the coming months.

For the long term, too, the outlook has not changed. For example, Secretary of Commerce Sinclair Weeks thinks the economy will grow nearly 50 per cent in the next decade. He makes this forecast:

	1958	1968
Population (millions)	173.0	205.5
Households (millions)	50.4	60.3
Employment (millions)	66.7	80.5
Gross national product (billions)	$416.0	$600.0
Personal income (billions)	$334.0	$475.0
Personal income (per capita)	$1931.0	$2310.0

No matter what the timing, we can be sure of two things: 1. We will emerge from the current recession to new levels of prosperity. 2. The organizations that are prepared will benefit most.

It means removing excess overhead, replacing productive capacity that can't pay its way, offering better products at prices appealing to the consumer, and strengthening administrative and sales organizations.

Most of all, it means acting now. The future won't wait!

Irwin H. Such

EDITOR-IN-CHIEF

PROGRESS REPORT ON INLAND EXPANSION

By December, 1958—500,000 additional tons of cold rolled sheets and enameling iron.

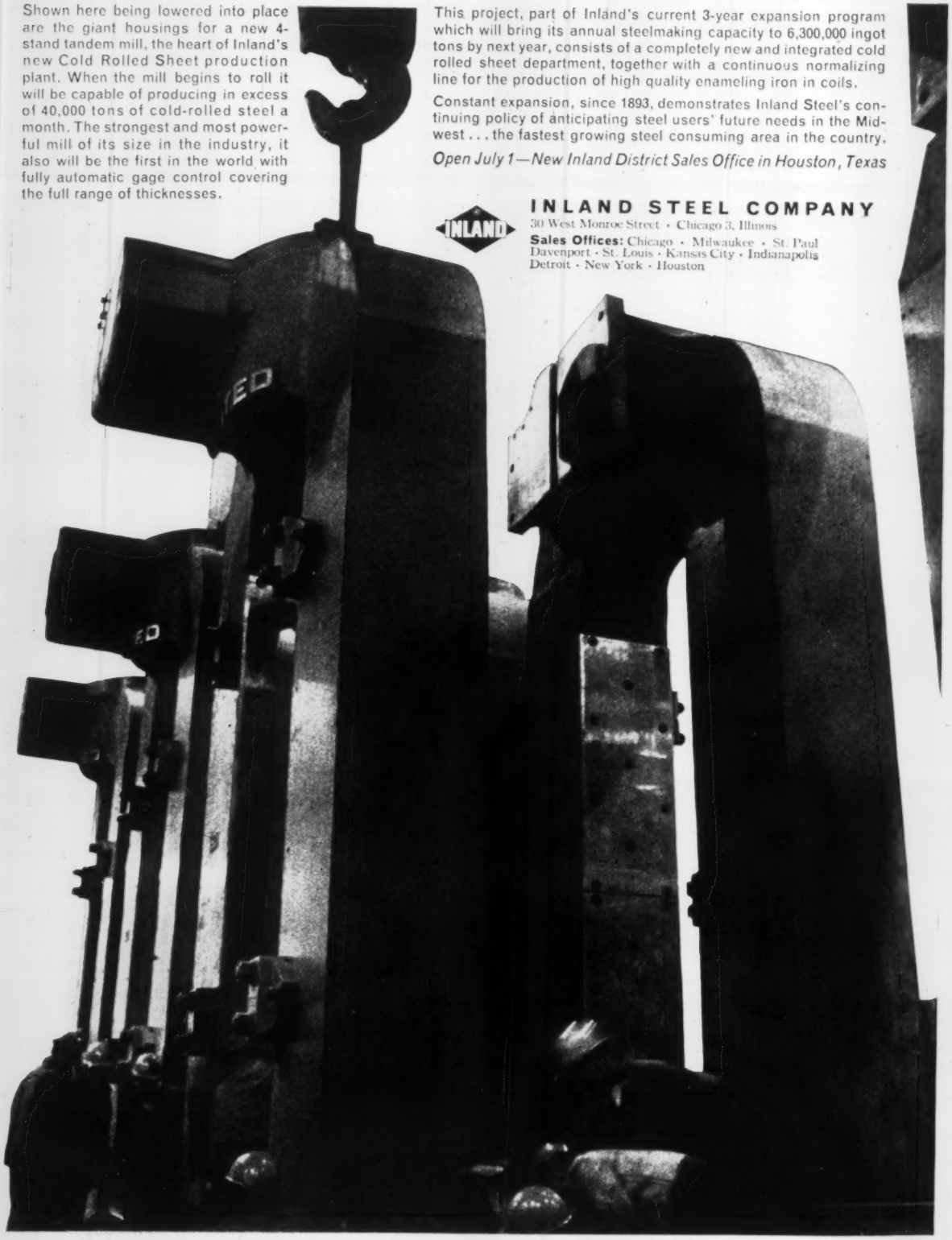
Shown here being lowered into place are the giant housings for a new 4-stand tandem mill, the heart of Inland's new Cold Rolled Sheet production plant. When the mill begins to roll it will be capable of producing in excess of 40,000 tons of cold-rolled steel a month. The strongest and most powerful mill of its size in the industry, it also will be the first in the world with fully automatic gage control covering the full range of thicknesses.

This project, part of Inland's current 3-year expansion program which will bring its annual steelmaking capacity to 6,300,000 ingot tons by next year, consists of a completely new and integrated cold rolled sheet department, together with a continuous normalizing line for the production of high quality enameling iron in coils.

Constant expansion, since 1893, demonstrates Inland Steel's continuing policy of anticipating steel users' future needs in the Midwest . . . the fastest growing steel consuming area in the country.

Open July 1—New Inland District Sales Office in Houston, Texas

INLAND STEEL COMPANY
30 West Monroe Street • Chicago 3, Illinois
Sales Offices: Chicago • Milwaukee • St. Paul
Davenport • St. Louis • Kansas City • Indianapolis
Detroit • New York • Houston



What Users Will Do If Steel Prices Go Up . . .

Makers of:		$4 a ton	$6 a ton	$8 a ton
Components	will absorb	60%	55%	45%
	will pass on	40%	45%	55%
Capital goods	will absorb	90%	80%	60%
	will pass on	10%	20%	40%
Consumer durables	will absorb	90%	90%	80%
	will pass on	10%	10%	20%
Construction equipment	will absorb	75%	60%	50%
	will pass on	25%	40%	50%

Percentages are arithmetical averages. Respondents' answers varied greatly.

Steel Prices: How Users Will React

They'll absorb more than usual because of competition. That indicates worse erosion of metalworking profits. The snowball effect of an increase will be minimized this year

STEEL consumers will absorb more of the coming ferrous price increase than any previous postwar hike, a STEEL survey indicates.

Respondents are nearly unanimous in believing that the boost will come, even though it didn't arrive on July 1 (for guesstimates on timing, see Page 153).

No Conformity—But there's little consistency among respondents about the percentage they'll soak up. Even direct competitors give diametric answers. Example: One maker of wire shapes says it will pass along the whole increase regardless of size; another says it will not pass on any part of it to customers.

Like examples can be found in nearly all industries.

One reason for such variances lies in a company's basic pricing policy. Some intend to pass along all added costs even if competitors don't. They say they'll sell on quality, service, and engineering. But the majority think keen price competition is the major consideration; they believe added costs could be relayed only at the expense of sales.

"The buyer now has the greatest advantage he has experienced in 20 years," asserts an Indiana partmaker: "If we hike our prices 4 per cent (the amount needed to pass along a $5-a-ton steel boost), he'll buy from a competitor who holds the line—and plenty of them will."

Who Gets Blamed—Strong disapproval of a steel price advance is voiced by many buyers. One calls it a "tragic step"; another says it's "sure to accentuate the recession"; many believe steelmakers should absorb their higher labor costs in view of today's depressed market. But others have resigned themselves to what they feel is inevitable; some even say they'll be happy if the increase is only $4 or $5 a ton.

Labor bears the brunt of metalworking's most cogent verbal attack. This statement by an Ohio spring producer is typical: "I blame irresponsible unions for the recession. Their unrealistic demands forced manufacturers to price people right out of the market."

Little Hedge Buying—Few companies are stocking up on steel in anticipation of a price rise. Their

reasons: 1. It often costs more to carry inventory than would be saved by advance buying. 2. They don't want to tie up working capital. 3. They can't predict types and sizes of steel products that will be needed. 4. They have ample inventories now. 5. A few say they don't believe steelmakers could make a price increase stick; they say it would be erased by freight absorption, giving of extras, and outright price cutting. A Michigan machinery maker feels there's no point in stocking up. "We've gotten good deals for the past year by haggling on prices," he says.

Paradox in Parts—A partmaker reduced its prices last spring, planning to raise them after the steel increase. Its reasoning: By giving customers a good deal for a few months, it expects to stave off resistance to an advance when it has to make one.

A bearing producer says it will freeze its prices "for at least a year—perhaps two." For some companies, lower nonferrous prices will help offset a steel hike, allowing respectable profits without raising prices.

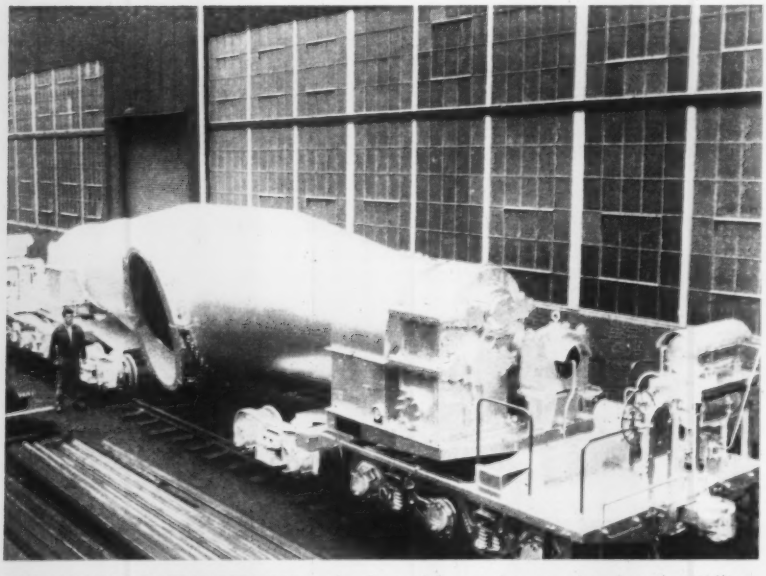
A Chicago partmaker says it will absorb added costs in areas where competition is rugged and relay them in other areas.

Capital Goods—Most machine tool builders say they'll absorb an increase. (Steel accounts for only a small percentage of their costs.) Some feel that addition of less than 2 per cent on machine price tags would make things balance. The cost of putting a new price into effect would be nearly as great as the income gained. And the recession will hold them back. They warn, however, that when the hike shows up to a large extent in motors, controls, and other components, they'll try to pass it along.

Producers of headers, alligator shears, and other products where steel is a major cost factor say they'll hike their charges. "But competition is so tough, we'd sure hold the increase down," says one.

Appliances—"We'll have to absorb the entire advance," laments a midwestern appliance maker who looks for steel to go up about $6 a ton sometime after mid-August. "The public won't stand for higher prices at a time like this," he says. Most of his competitors echo those remarks. But an Ohio firm says its appliance prices will climb. "Our industry has absorbed so many cost increases now that some companies are operating at a loss. Add a steel price hike and a wage boost—we follow the steel pattern—to that and some more of us will go into the red. The only answer is to boost prices," he reasons.

Smaller Snowball—Because more than usual will absorb, the snowball effect of the increase will be reduced this year. In previous boosts, the added cost of steel in a refrigerator, for example, may have been $1, but the total added cost was two or more times that because other goods and services needed to make the refrigerator had gone up, too.



THIS HOT METAL TRANSFER CAR is the first of five to be completed at the William B. Pollack Co. plant in Youngstown. It will carry 150 tons of 2800° F iron. It is welded, light in weight, and has 20 wheels

Electrical Appliances Off

Here's a comparison of total industry sales of major electrical household appliances during the first five months of 1957 and 1958 as compiled by the National Electrical Manufacturers Association.

Number of units—first five months

	1958	1957
Refrigerators	1,168,700	1,498,700
Freezers	372,100	376,400
Ranges (over 2½ kw)	527,200	612,400
Water Heaters	322,900	322,200
Dishwashers	149,800	157,800
Food Waste Disposers	221,400	211,500

AEC Begins Atom Center

Construction is underway at Lemont, Ill., on a $10-million fuels technology laboratory for Argonne National Laboratory. Prime objective: To speed research on possible uses of plutonium as a nuclear fuel.

Plutonium offers the greatest potential in this area because of its availability, says Dr. Frank G. Foote, director of Argonne's metallurgy division. In a ton of natural uranium, there is 140 times more U-238 (from which plutonium is made) than U-235 (the fissionable isotope).

Armco Cuts Pollution

New waste water clarification equipment costing $250,000 has been installed for blast furnaces at the Ashland, Ky., Works of Armco Steel Corp.

An 8000 gallons per minute thickener will remove finer particles of iron ore from the water than did the settling basin used previously.

The thickener will serve the Bellefonte blast furnace but has capacity for an additional furnace.

The iron ore recovered will go to a new sintering plant at Ashland to be processed for re-use.

Play Products Buck the Recession

Sales will be better than ever this year. Reasons: More children, the trend to participative sports, and the consumer has temporarily satisfied his needs for capital goods

AMERICANS are playing harder than ever. Metalworking's makers of leisure time products will score a 5 per cent sales increase this year.

Here's part of the metalworking industry that's still booming:

- Golf club manufacturers look for at least a 5 per cent sales boost over last year's $32.1 million volume.
- Outboard motor makers expect a healthy increase over 1957's dollar volume, with unit sales remaining about the same. But they were forced to lay off men early last month because this year's production schedules were pinned to an anticipated 20 per cent sales increase.
- A producer of fishing tackle, Great Lakes Products Inc., reports sales in the first five months were 20 per cent ahead of last year's.
- Sales of metal outdoor furniture are running 5 to 20 per cent ahead of 1957's in most areas. Sales at the manufacturers' level were $55 million in 1954 and should hit nearly $100 million this year.
- The swimming pool set is still gaining members. *Swimming Pool Age* estimates that 53,000 pools (costing over $600 million) will be built this year. Metalworking's biggest stake is in accessories—filters, lights, ladders, water heaters, fences, vacuum cleaners.

Recession-Proof?—Why the boom in the leisure time market? Edwin L. Parker, president of A. G. Spalding & Bros. Inc., offers this explanation:

"The public, like industry, has caught up with its capital goods expansion. Families are saying they'll make their car, home, refrigerator, and TV set do for a year or two—because they're new or nearly so. Until the public begins a new capital goods buying surge, it'll keep spending for leisure-luxury items."

Adds J. W. Kelly, vice president of MacGregor Co.: "The increasing number of children between 5 and 12, plus the increasing number of schools, is a factor in sporting goods sales."

Boating's Big—Outboard motor and boat producers credit two other factors: 1. Purchasers are generally in the middle and upper income groups that haven't felt the recession yet. 2. There's a trend toward participative (vs. spectator) sports.

Retail sales of outboard motors should top $270 million this year. Helping to boost dollar volume is the trend toward bigger motors. Johnson Motors and Evinrude Motors, both divisions of Outboard Marine Corp., brought out the first V type, 4 cylinder outboards (50 hp) last fall.

Johnson reports unit sales from

Oct. 1 last year through May 16 this year match those of the previous period; but because of demand for the new, more expensive motor, dollar volume is 15 per cent higher.

Howard F. Larson, Evinrude's sales and marketing director, points out that 30 to 50 hp motors will account for 57 per cent of his firm's production this year.

In addition to the V-type engines, other automotive influences are showing up in the outboard industry. West Bend Aluminum Co. has introduced a 20 ampere, alternator type generator and incorporated a direct battery ignition in its two 35-hp motors. Its motors also feature sports car control panels.

Aluminum, which made tremendous inroads in the outboard boat industry in the last few years, has encountered an aggressive new competitor — Fiberglas. Retail sales of all boats—wood, aluminum, and Fiberglas—came to about $120 million last year.

The Price Factor—R. P. Wold, vice president of Cadillac Marine & Boat Co., says the recession appears to have an influence on sales of aluminum and wood boats, but lower priced aluminum boats are moving better than they did a year ago. D. O. Tomlin, president of Lone Star Boat Co., predicts his firm's sales will top last year's by 10 per cent.

The seasonal nature of the boat industry is creating many headaches. Aluma Craft Boat Co. says it ships 50 per cent of its annual production from March through June. Many firms are looking for ways to diversify.

Sales Confidence High—Sales in the major department, discount, and sporting goods stores support the confidence of manufacturers.

Macy's in New York reports a gain and expects the trend to continue. During the first five months of this year, Gimbel's (Pittsburgh) had a 15 per cent increase over sales in the same period of '57. A Washington department store says its fishing tackle sales are on a par with 1957's, and it "wants to find a boat manufacturer willing to sell competitively with the Sears, Roebuck product." Chicago sporting goods stores report golfing equipment sales are well ahead of last year's, but outboards are lagging slightly because of the weather.

Motorola Personalizes

1. Special assignments to gain experience.
2. Multiple management.
3. Planned experience.
4. Coaching, counseling by superior.
5. Service on committees.
6. Conference participation.
7. Channeling more information to the executive.
8. Change of job.
9. Plant tours.
10. University part-time programs.
11. College recruitment—testing and integration.

Building Better Bosses

The Chicago firm tailors management development program to its own circumstances. The key: Annual supervisory appraisal counseling to find specific problems

PACKAGED EXECUTIVE development courses are good, but Motorola Inc., which takes a do-it-yourself approach to management development, wanted a special package—a course tailored as nearly as possible to the individual requirements of 250 middle managers.

The Core — Appraisal-counseling, the heart of Motorola's development program, provided the tool. Annually, each supervisor makes a written appraisal of how his subordinates performed, following up with private interviews to discuss the review. He points out the individual's key strengths and major weaknesses.

"We analyzed the performance appraisals of all 250 managers," says E. T. Carroll, executive development administrator. "We were able to isolate major weakness areas, such as human relations, organization structure, control procedures, marketing, production planning, and the financial function.

"We took the appraisals to Drs. E. M. Barnet and Thomas McNichols of Northwestern University's Institute of Management who helped design a program."

Format Developed—An eight-week course evolved. The initial class was limited to 30 to permit active participation. All corporate functions were represented to provide balance. Three-hour sessions with a 15-minute break were held once a week. A case history and discussion format was used, and Drs. Barnet and McNichols led the discussion.

"The objective of the sessions," stresses Larry Wrenn, training director, "was not to spoon-feed pat answers, but to stimulate thought processes from a management point of view. Preparation for the sessions often required 6 or more hours of outside reading."

Sample Session—Topic seven was on corporate organization and control. Preparation required the reading of a famous case history: The management reorganization of Consolidated Vultee Aircraft Corp. under T. M. Girdler during World War II. These comments kicked off the session:

"Tom Girdler's organizational setup was the most contradictory mess I've ever heard of. Division managers weren't managers; everybody had too many bosses."

"You've missed the point, Bob. There was a war on. Girdler had one objective: Get production out the door—and do it quickly. I

Development by . . .

12. Trade and management association activities.

13. Participation in public affairs.

14. Consultation with physicians on health problems.

15. In-plant training courses.

think he did a tremendous job."

That exchange touched off a lively 1-hour discussion of Mr. Girdler's organization techniques and their effectiveness in operation. At the end of the hour, no one ventured a "black" or "white" evaluation.

The Target—Motorola aims at the personal touch in all its executive development activities. The program has five major steps:

1. Reporting charts of the executive structure are drawn up annually for the development program policy committee. Incumbents in all positions are shown. The presentation provides the blueprint for determining organizational changes and executive requirements.

2. Participants for executive development are selected by vice presidents or major department heads with the approval of the policy committee.

3. Each participant prepares his own job description and the method of measuring his job performance. He submits them to his superior for approval.

"This step is tremendously important," relates Mr. Carroll. "The individual develops a complete understanding of his job—its policy planning, administration, reporting, and financial responsibilities. And it provides a base for mutual understanding between the individual and his superior."

4. The superior's annual performance review of the individual is based upon the method of measurement developed by the individual. Aside from the written appraisal, the superior also prepares a promotability report on the individual for the policy committee. Ratings are: Immediately promotable, promotable after training, promotable in the indefinite future, inadequate performance.

5. In the counseling session, the superior and the individual, using the review as a tool, determine a development plan.

Remedial Plan — Generally, a year-long program is planned, incorporating one or more of the techniques listed above. Six months later the individual meets with the executive development co-ordinator for a progress review. Where shortcomings are noted, the co-ordinator may suggest a new approach for the individual, subject to the approval of his superior.

Motorola has set up its executive development program based on the philosophy that 75 per cent of all development is on the job under competent leadership. The concept implies a two-pronged responsibility:

1. The company can provide the encouragement and atmosphere for growth. But the individual must do the growing by supplying his own ingenuity and resourcefulness.

2. Executive development is a line function supported by staff activities. Emphasizes Robert W. Galvin, president: "The most important test of our managers is their ability to develop and make available capable executives to our growing organization."

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Pay Rate Shows Rise

Salesmen are earning 4.2 per cent more this year than last, survey by AMA shows

SALESMEN for U. S. manufacturers are getting 4.2 per cent more pay than they were at this time last year, says the American Management Association.

A survey encompassing 32,000 personnel shows that during the last year average earnings of consumer goods salesmen rose 6.9 per cent, vs. a jump of only 3.2 per cent for industrial products salesmen. Despite this, the pay range in industrial sales is significantly higher than that in the consumer field.

Incentive Pay — Reflecting what seems to be a trend, over 75 per cent of the firms surveyed pay bonuses, commissions, or both. Payments range from less than 10 per cent to 100 per cent of total compensation. About 90 per cent of the companies queried have retirement plans for salesmen. Over 80 per cent give them three weeks' vacation (usually after 10 or 15 years' service) and about 35 per cent give four weeks' vacation to personnel with 20 or 25 years' service. Almost all provide insurance and medical benefits.

One major reason for pay and fringe benefits is that competition for salesmen forces companies to at least match what others are offering.

Weighs Sale of Stores

U. S. Steel Corp. may bow out of the food, clothing, and service station businesses. W. D. Self, division manager of the corporation's Union Supply Co., says he's considering plans to sell nine retail stores, six service stations, and a warehouse in Birmingham. Union Supply sells furniture, appliances, clothing, gasoline, and tires to the public as well as Tennessee Coal & Iron Div. employees.

Originally formed to maintain retail stores for coal miners, Union Supply operates in Pennsylvania, West Virginia, Kentucky, Utah, and Alabama. Mr. Self reports that he doesn't know of plans to sell stores in other states.

Disintegration of a jet: This was a modern jet fighter before it met an Army Hawk at White Sands, N. Mex. One of our newest weapons, the Hawk is a homing killer, produced by Raytheon Mfg. Co.

MISSILES:

They Make Other Weapons Obsolete

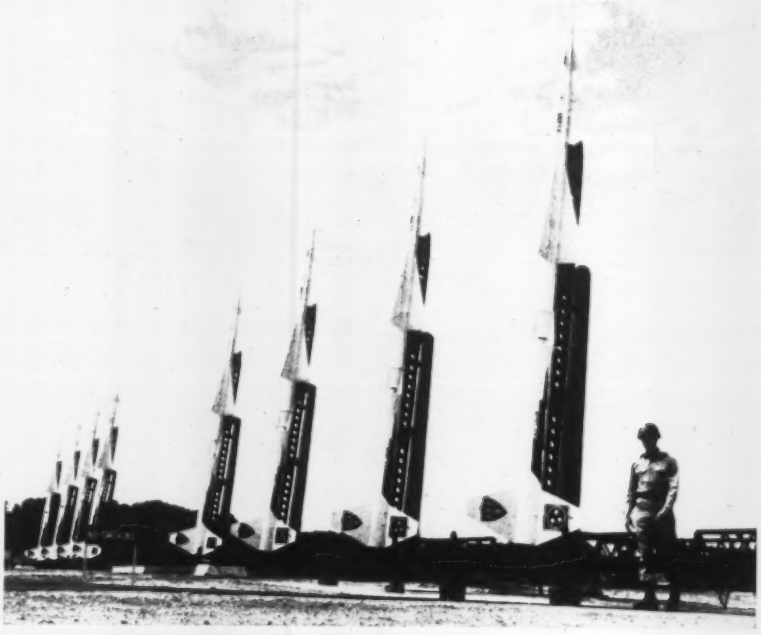
"GAD, I'm glad my retirement comes up next year. This stuff makes obsolete everything I've learned."

The speaker was a three-star general watching the Army's missile shoot (Project Ammo) at White Sands, N. Mex., July 1.

Consensus was that the general was right—as far as he went. Industrialists, military authorities, and writers were tempted to say that the missiles demonstrated make obsolete all weapons heretofore used. They believe that aircraft and ships in the future will be used only as platforms for launching missiles, and, of course, to move men and materiel.

The devastating firepower, accuracy, and mobility of the limited range missiles pictured on these pages opens a new phase in modern warfare and a new phase in materiel production.

Equally interesting to many industrialists watching the shoot was the supporting equipment — transporting, handling, erecting, and launching — required in the missile program. It opens a vast new market for metalworking products.

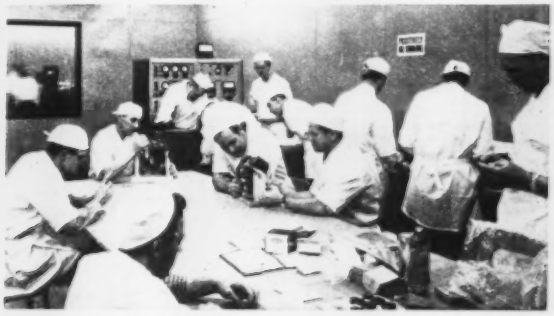


First generation of the Nike family, the Ajax is the present mainstay of our missile air defense. It guards many of our major cities. It is designed to intercept and destroy enemy planes regardless of evasive action. Produced by Western Electric Co.

Called the Honest John because of its accuracy and reliability, this long-range artillery rocket carries either an atomic or conventional warhead. It has more mobility than artillery. Maker: Douglas Aircraft Co.

The Lacrosse, surface-to-surface guided missile, provides close tactical support for ground operations. It is air transportable and can be brought into action as quickly as artillery. Made by Martin Co.

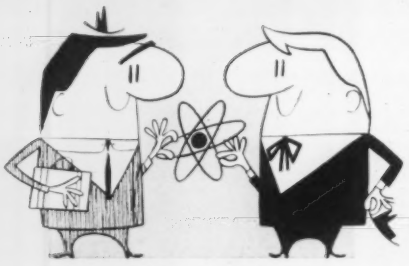
The Hercules, second generation of the Nike family, soon will replace the Ajax in defending critical areas. Here the missile rests on a launcher produced by U. S. Steel Corp.'s Consolidated Western Steel Div.



Because dust and foreign particles could play havoc with the delicate missile parts, critical components for the Sergeant are assembled under clinical conditions at Sperry Rand Corp.'s Utah engineering laboratory

Baby of the Army's missile family is the Dart, designed to deliver a warhead with pinpoint accuracy to defeat the heaviest known enemy armor. Product of Curtiss-Wright Corp., the Dart takes off from "zero-length" launchers—typical of ground support devices which are also becoming important products for metalworking

Armed helicopters may become important in future wars. Here a Choctaw, armed with forty 2.75-in. rockets, two 5-in. rockets, two 20-millimeter cannons, three 50-calibre and six 30-calibre machine guns, takes off for tests at White Sands. Produced by Sikorsky Aircraft Div., United Aircraft Corp.



New Hope for U. S. Atom Program?

AN ERA of good feeling is about to descend upon the U. S. atomic power program. While it may not be entirely fair to Adm. Lewis L. Strauss to point out that this coincides with his departure from the Atomic Energy Commission, it is, nevertheless, true. The new AEC chairman, John McCone, is touted as a devotee of the private power philosophy, but it is also necessary to note that coincident with Admiral Strauss's departure, Sen. Clinton Anderson (D., N. Mex.) one of the most powerful members of the Joint Congressional Atomic Energy Committee, has called the public-private power issue a "phony" as far as atomic energy is concerned. Voting unanimously for Mr. McCone's confirmation as an AEC member, the joint committee followed with a $387 million AEC construction program for fiscal 1959.

Senator Anderson, the man probably most responsible for Admiral Strauss's resignation (the admiral wrote Ike that "circumstances beyond the control of either of us make a change in the commission chairmanship advisable"), now affably predicts "enduring good faith" between the committee and the commission.

Joint Committee Will Have Its Way

The point to all this talk is that the committee believes Congress has regained control of our atomic program. Two contract awards last week point this up: General Dynamics Corp. will build a gas-cooled nuclear powerplant for merchant ship propulsion (this is different from the *N. S. Savannah*'s powerplant, our first nuclear ship scheduled for completion by 1960); and General Dynamics' General Atomic Div. will do a feasibility study on space travel via "controlled nuclear explosions." Under committee pressure, AEC is also readying a test of Project Rover components late this year (the nuclear rocket propulsion project). The committee expects both houses of Congress to O.K. its increased atomic construction appropriation, and with Admiral Strauss gone, expects no reluctance from the AEC to spend the money. No one would be too surprised either to see the atomic plane program get a boost after Mr. McCone has been around a while. Long range plans of the committee look like this: Additional reactor projects to be offered to private industry, but carried forward by the AEC if industry won't or can't do the job; federal grants up to 90 per cent of the difference between the cost of electrical energy produced by nuclear power and conventional power; increased technical information to industry on heretofore secret research in atomics. Senator Anderson is advocating the "generation" theory for atomic plants; that is, the Defense Department is willing to spend hundreds of millions of dollars on first generation missiles, even though it knows second and third generation birds are already on the drawing boards. He wants the AEC to build generations of plants in the same way to provide industry with experience necessary for rapid future development.

SBA's Future Is Assured

Another Washington agency can begin thinking of itself as a permanent fixture of our government: The Small Business Administration is a permanent agency by order of Congress. The Senate version of the legislation also raises the size of an individual loan to $350,000 and provides for joint research and development efforts by small firms to increase their share of defense business. A conference between House and Senate leaders will settle the matter of interest rates for SBA loans (the House wants them cut from 6 to 5 per cent).

New Horizons For Beloit Iron Works

Advice to "open a Washington office if you want government business" has been followed by Beloit Iron Works, Beloit, Wis. Its Special Products Div. did the job so well it hired Robert Weadock away from Sen. George Smathers' (D., Fla.) Government Procurement Subcommittee. Around Washington, that's proportionately equivalent to Arthur D. Little Inc.'s recent signing on of the Army's R&D chief.

The papermaking machinery manufacturer is hard after missile contracts on an associate contractor or first tier subcontractor basis, as well as prime contracts for conventional weapons.

Changing Role for BDSA?

A highly placed director of the Business & Defense Services Administration is guessing that the merger of the Office of Defense Mobilization and the Federal Civil Defense Administration may have some side effects on other government agencies. BDSA's job may shift more definitely into the area of "service to business" than it ever has before, and away from its mobilization responsibilities, he says.

Some observers see all mobilization activities of BSDA, the General Services Administration, and other agencies being gradually gobbled up by the new Washington "empire," the Office of Defense & Civil Mobilization—that's exactly what some congressmen have feared. ODCM is directly under control of the White House, and Capitol Hill is feeling increasingly shut out of mobilization planning these days.

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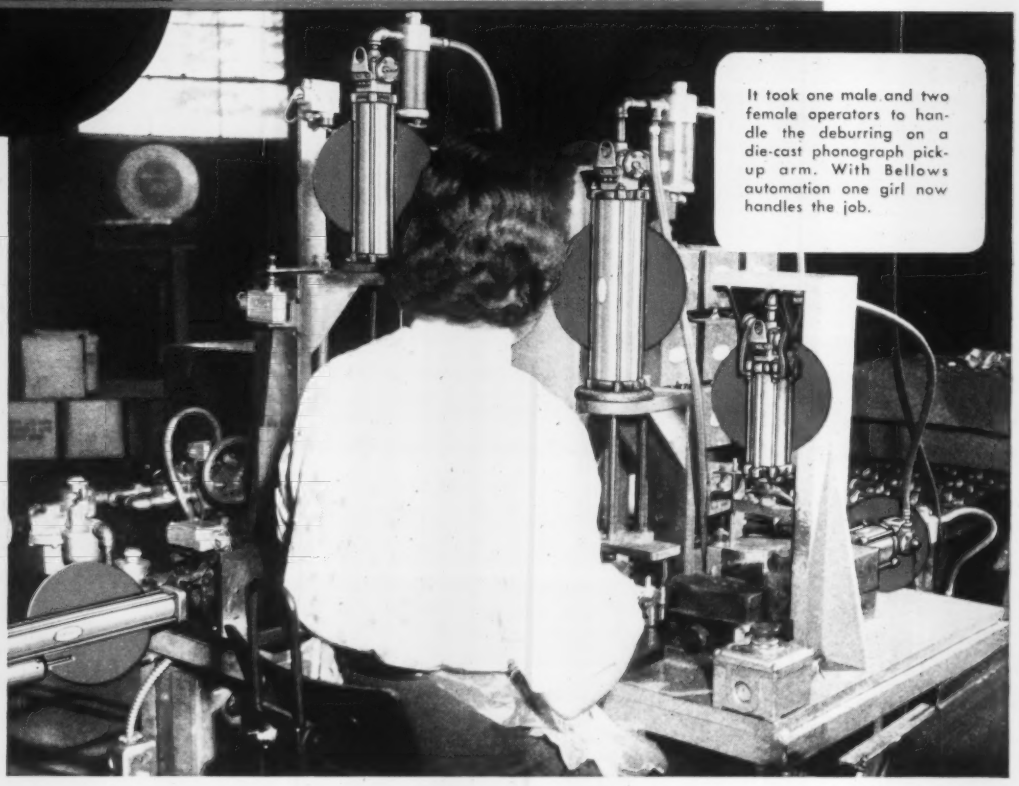
"SPOT" AUTOMATION"



It took one male and two female operators to handle the deburring on a die-cast phonograph pick-up arm. With Bellows automation one girl now handles the job.

. . . a fast approach to important cost savings

Any plant, no matter how large, consists of many "small plants" or separate manufacturing centers. Sometimes these separate manufacturing centers consist of no more than a single operation; sometimes they embrace a group of related operations.

A quick approach to important cost savings can be to "spot automate" these separate "small plants" with Bellows Controlled-Air-Power Devices.

These packaged work units can be quickly incorporated into existing equipment to make it fully automatic; can be used to interlock or program a number of machines or operations; or can form the key components in low-cost, tool room-built, special purpose machines.

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Fan Orders Slow Down

Producers expect their dollar volume to decline for the second straight year, reflecting lessened activity in their major markets. But they say long range prospects are good

THE GALE of industrial fan orders in 1956 and early 1957 has subsided to a breeze. That's the report of major producers checked by STEEL.

For this year, the makers predict a 12 to 14 per cent dip from 1957's sales volume of about $85 million. Their best year was 1956 when shipments climbed above the $100 million mark.

Company replies show 1958 first half sales ranging from 11 per cent above to 28 per cent below 1957 first half levels. Comparing full years, their predictions range from "12 per cent higher" to "20 per cent lower." Nearly half the producers questioned expect declines of 15 to 20 per cent.

Majority opinion: Orders picked up somewhat this spring but are beginning to level off. (A few firms see the upswing continuing; Buffalo Forge Co. says current order volume is 10 per cent higher than that of three months ago.) High inquiries point to a pickup in the late summer preceding a winter plateau period. (A spokesman for Westinghouse Electric Corp.'s Sturtevant Div. says inquiries have been unusually high all year.)

Price Competition Is Rugged—Fanmakers don't think they'll be able to boost prices this year. A few say they'll act if steel prices go up "substantially." Most of them raised quotations during 1957's last quarter; a few have held the line since 1956. One sales manager says his present prices are only 3 per cent above 1953's.

Bargains are readily available as a result of fierce competitive bidding. One maker says he was "grossly underbid" on an assembly plant ventilation job. Prices are especially soft on larger jobs.

Buying "Steady" to "Lousy"—The public utility market is holding up fairly well. Some producers expect record sales to that area. Despite the decline in industrial construction, sales of plant ventilation equipment are expected to fall off less than sales of other fan types.

Producers offer these explanations: 1. There's a substantial amount of modernization. (Still, two out of seven makers expect new plants to be their best 1958 market.) 2. Ventilation systems are going into a greater percentage of new buildings than in past years.

The metalworking market (especially steel plants and foundries) has curtailed buying the most, say fanmakers. Process industries are the best present industrial market.

Show Good Potential—Robinson Ventilating Co., Zelienople, Pa., reports that circulating air in furnaces up to 1800° F is a growing application. Bayley Blower Co., Milwaukee, sees good growth potential for ventilating sets (packaged units). Several makers announce widening use of synthetic fibre filters. Applying airfoil design to centrifugal fans and roof ventilators is reported by ILG Ventilating Co., Chicago.

United Blower Co. Inc., New York, is finding a big market in the cooling of electronic devices.

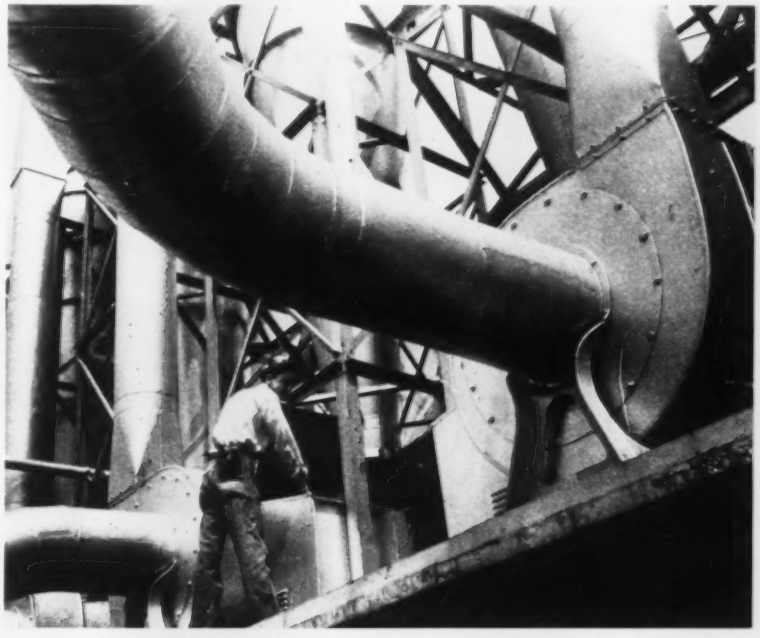
Fanmakers can expect greater competition from producers of evaporative coolers. One such firm, Palmer Mfg. Corp., Phoenix, Ariz., says its unit sales volume is nearly 13 per cent ahead of last year's.

Research Spending High—Nine out of ten fanmakers will spend more dollars for research and development in 1958 than in 1957. Lau Blower Co., Dayton, Ohio, has boosted such spending 50 per cent; Garden City Fan Co., Niles, Mich., 30 per cent.

One company "hopes to have three profitable new products by yearend." Two firms say they'll concentrate on developing units for high temperature applications. Filter improvement is getting attention.

Perhaps 60 companies make industrial fans. Twenty firms do about 70 per cent of the business.

Warning—"Thousands of dollars are wasted annually to power inefficient fans or modern fans improperly applied," asserts Jeffrey Mfg. Co., Columbus, Ohio. The company suggests that prospective buyers consult suppliers' engineers before deciding on types and design.



Westinghouse Electric Corp.'s Sturtevant Div. made this fan setup

New Box Saves Allegheny Ludlum $66,000

PROBLEM: Raymond L. Anderson, general superintendent-finishing, at the West Leechburg Works of Allegheny Ludlum Steel Corp., puts it this way: It appeared that the cost of packaging stainless steel circles for the cooking utensil industry was too high and deliveries were often delayed.

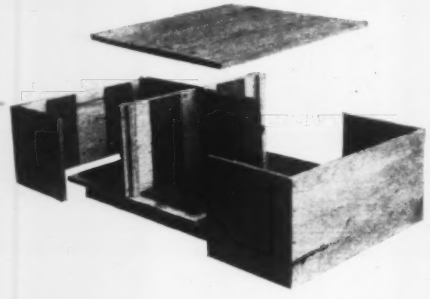
BEFORE: Circles had to be inspected, stacked, and loaded into boxes or onto skids by hand. Oversized boxes were needed to allow for hand room during loading. The excess space permitted movement of the stacks during shipment.

Blanks coming from the press were first stacked by hand. Four to six stacks were put on a platform which had to be turned by a hand truck at least once during each loading operation. The platform was then moved by hand truck to the inspection area. One worker inspected and restacked while another placed 30-lb Kraft paper between each blank to prevent surface scratching during shipping. The lid was nailed on and the box secured with strapping bands.

The process was the same for skid and shroud packaging except that the package was wrapped with waterproof paper and banded.

AFTER: The new box (see photo) is designed for easy access to the stacking sections. Cardboard strips 3/16 in. thick and 4 in. wide are placed at pressure points on the four sides of each partition, and cardboard cushioning is put in the box bottom and top.

The circles come directly from the press to the packing area where they are inspected and put in the open sections. When the partitions on one end of the skeleton are filled, a turntable rotates it for stacking in the other end. When all sections are filled, the base is moved by conveyor or fork truck to the bundling area where the outside of the box is positioned. Band strapping completes the pressure application by drawing the assembled sides and ends tight against the circles.



Industry Takes New Look at Packaging

Redesign of container could mean cost savings in materials and shipping. Color and display printing catch on as tie-ins with advertising. Aluminum, plastics make inroads

INDUSTRIAL PACKAGING, long considered merely the covering for goods in storage or transit, is becoming recognized as an important area for cost cutting and increasing efficiency. "Too many companies put a $1-million product in a $1 package," claims an official of Industrial Packaging Co., Cleveland.

While not everyone can match the savings reported by Allegheny Ludlum Steel Corp. (described above), you may be able to make a contribution to your over-all cost reduction program by taking a new look at current shipping practices.

Examples—Hinde & Dauch Paper Co., Sandusky, Ohio, maker of corrugated shipping containers, cites several examples where change of design paid off handsomely.

Garlock Packing Co., Palmyra, N. Y., switched from a wooden case to an octagonal corrugated drum for shipping its lead-tipped rubber gaskets. Results: Faster set-up, quicker packing, reduced package size and weight, lower box cost, better protection for the gaskets, and annual savings of $13,500.

Norton Co., Worcester, Mass., turned from a wooden, sawdust packed crate to a palletized corrugated package for its heavy grinding wheels. Box cost was cut one-third, packing time one-half. The pallets also serve as convenient storage racks, and the fire hazard created by the sawdust is eliminated.

How It's Done—Most container manufacturers maintain their own design and testing labs where customers' problems are tackled with one aim: Reduce the cost and increase the efficiency of the package. Design engineers at H&D say that when a client brings in a box with three pieces of cushioning material, they automatically look for ways to reduce the number to one, cutting the cost of materials and reducing shipping weight.

The same kind of service can be obtained from packaging consultants or some of the larger packaging-shipping companies which are springing up in heavily indus-

	BEFORE		AFTER
	Interleaved Skid	Interleaved Box	Pressure Point Package
Labor	$38.76	$38.13	$ 8.00
Materials	8.29	13.78	15.96
Maintenance, Power, Supervision, Overhead	34.53	34.53	34.53
TOTAL COST	$81.58	$86.44	$58.49
Less Pricing Extra	20.00	30.00	30.00
NET COST	$61.58	$56.44	$28.49
Net tons per month	90	90	180
Avg cost per month using interleaved packaging		**$10,620.00**	
Avg cost per month using pressure point package		**$ 5,128.20**	**SAVINGS PER YEAR $65,901.60**
		$ 5,491.80	

trialized areas. Such firms specialize in shipping for manufacturers who have no packaging departments, or who have knotty packaging problems which they are not equipped to handle. Says the sales manager of one company: "We can do the job cheaper than the manufacturer because our labor rates are generally lower. Also, we save him the cost of expensive packaging equipment."

Added Value—Almost as important as cost cutting is making the package work for you as an advertising medium. Many container manufacturers claim industrial producers overlook the opportunity to tie in their advertising and shipping functions.

Some companies (such as International Harvester Co.) don't pass up an opportunity to use a symbol, monogram, or trademark on containers. Some use a particular color to identify the company. Armstrong Cork Co. combines the ideas. On each of its packages it prints the trademarked circle A for company identification. The circle is printed in various colors, each one representing a particular type product.

Color Catching On—Hankins Container Co., Cleveland, believes the trend is toward more use of color and display printing. About 90 per cent of its output has some prominent company identification. "It's not a question any more of our suggesting the use of color," says one sales official. "Even industrial customers are asking for it more and more."

Standardization by Company—One of the biggest problems in industrial packaging is the large number of sizes, causing shipping, loading, and storage problems. Ford Motor Co. is seeking a solution by setting up specifications for venders of small, dense parts. All but 120 of the 1600 parts covered are converted to a standard package.

By Industry—Another way is to standardize the packaging of a whole industry. The Industrial Fastener Institute has spent several years developing such a program and is continuing its efforts. The IFI specs list three standard sizes of shipping cases and 13 sizes of cartons.

Lamson & Sessions Co., Cleveland, has been using the system about two years. It was able to replace 30 to 40 sizes of boxes with standards, reducing purchasing problems and costs. Because the new boxes can be stacked in almost any combination, storage problems have also been solved for L&S and its customers.

New Materials—While the corrugated container is still king, materials such as aluminum and plastics are gaining supporters. Most of the development work in aluminum has been aimed at consumer products (foil and laminations) and petroleum products (cans). But aluminum producers are predicting rapid progress for their product in industrial applications. Areas most likely to see advances soon: Multiwall bags for shipping dry chemicals such as soda ash; aluminized pallets with a good strength-weight ratio and long life; aluminum bottles for essential oils and chemicals; and foil laminated with corrugated paper.

A comparatively new use of plastics is the "bubble" container which protects the product and gives visual proof of contents. Vascoloy-Ramet Corp., Waukegan, Ill., is packaging its carbide inserts in such containers. The 2½ x 3 in. package has five inserts identified by a slide-in card. Added advantage: The container can be filed in a drawer like an index card.

Ford's Program—"The same planning should be given to the development of packaging specifications and their effect on handling and shipping as that given to manufacturing the part (to be shipped)."

That is Ford's philosophy of packaging. At Ford, the packaging function is an important part of the new integrated material handling system in which individual requirements and interdependent relationships of product design, packaging, shipping, control, and intraplant handling are analyzed to get the most economical movement and storage of materials.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.*

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...“the best tank lining we’ve ever had”

SAYS THIS LARGE ACID-CARRYING FLEET OWNER

One of the largest fleets of acid-carrying trucks in the East is P. B. Mutrie Motor Trans., Inc., owner of about 50 acid tankers. The truck above is one of their newest, and is the largest *rubber-lined* tank truck in New England, and one of the largest in the country. Like the other dozens of Mutrie’s tanks, this one is lined with PERMOBOND,® the rubber lining that is resistant to corrosion, and that prevents iron rust from contaminating the chemical in the tank. This truck also carries a U. S. Rubber Acid Discharge Hose, engineered to fit particular corrosion conditions.

Any container of corrosive acids, no matter how complex its shape, can be lined with PERMOBOND—whether it is original equipment or existing equipment—whether it’s over-the-road tank trucks or railroad tank cars.

So, for any rubber lining requirement, contact tank lining experts at U. S. Rubber, Mechanical Goods Division, Rockefeller Center, New York 20, N. Y.

In Canada, Dominion Rubber Co. Ltd.

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Changeovers Are Complicated

It takes more than a year to gather information needed for new tools and equipment. Why this is so is explained as Buick gets set to start on '59s in mid-August

TO PERSONS unfamiliar with the auto business, model changeover time often seems like a two or three week hiatus after which new cars appear like metal moths out of brick and mortar cocoons. But to the industry the changeover is almost an anticlimax to more than a year of preparation.

This year, General Motors' Buick Div. is the first to go down for the change. Buick phased out its 1958 lines June 28 and is scheduled to start buildups Aug. 18 for 1959. Component production started last week. Since most of the co-ordination for the changeover rests with the master mechanic sections, T. R. Timm, Buick's general master mechanic, outlines what happens before a new model can appear.

Needs Headstart—"At least a year before the new model is introduced, our group begins collecting cost 'guesstimates' as production engineers begin deciding what tools and equipment they'll need as a result of changes in car design," explains Mr. Timm. This information is funneled into Mr. Timm's 75-man group. Experimental work begins on production tools and methods which may be used in the upcoming model run.

In three or four months, the master mechanics have enough data to develop a fairly accurate estimate of new model tooling costs. This estimate goes through the top management wringer and is discussed and changed until formal project approval is given. For the 1959 model, project approval came on Dec. 13, 1957.

"This may sounds a little haphazard, but we've found that our total estimate will come within 10 per cent of the actual cost," says Mr. Timm. Considering that new model tooling can easily run $150 million or more, this is a reasonable margin of error.

Orders Go Out—The division then can place orders for tools and equipment. In practice, many verbal orders are placed earlier because it often takes more than a year to build some of the larger machines and tools.

During this period, Mr. Timm says, production engineering and master mechanics work together to see if any tolerances or designs can be changed to permit present equipment to be used.

Bible Is Written—Now the master mechanics start writing the routing sheets which are the changeover bible. They show what machines will be used, where they're to be placed, and what kinds of tools and fixtures will be used with them.

Plant layouts are drawn so works engineers will know what machines are to be installed, and which can be left or realigned. "We like to get this started as soon as possible because there are a lot of piping and wiring changes that can be effected before the lines close down," Mr. Timm explains. Layouts and routing sheets are sent to the standards engineers and production standards

First Half Car Production

	1958	1957
Cadillac	77,051	85,032
Lincoln	14,833	23,945
Chrysler	30,245	72,614
Imperial	7,618	24,377
	129,747	205,968
Buick	133,095	238,973
Oldsmobile	179,386	228,642
Pontiac	120,185	198,672
Mercury	64,262	171,484
Edsel	6,944	
De Soto	19,867	72,860
Dodge	56,141	170,443
	579,880	1,081,074
Chevrolet	712,491	792,004
Ford	504,975	819,881
Plymouth	202,386	380,788
	1,419,852	1,992,673
Rambler	92,812	55,537
Studebaker	17,973	31,116
Packard	1,503	4,573
	112,288	91,226
Totals	2,241,767	3,370,941

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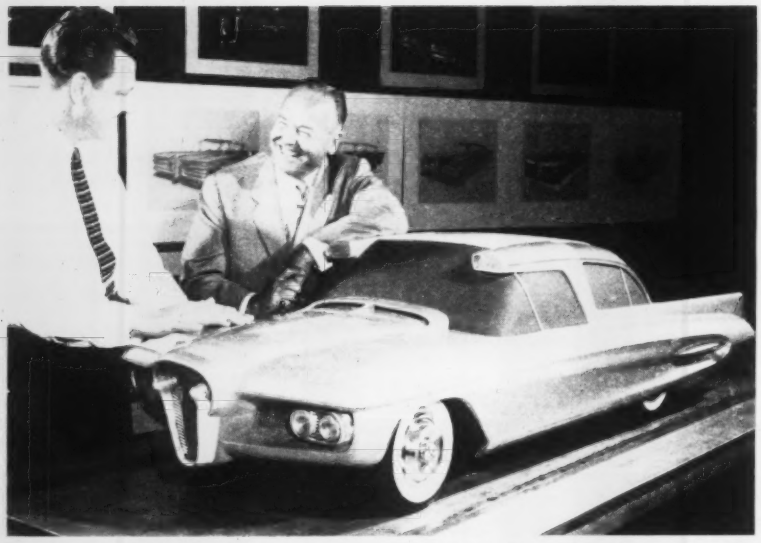


FORD'S E 196X shows what might happen to Edsel's front end. George Walker, Ford Motor's styling vice president (right) and I. B. Kaufman, Edsel's executive stylist, point to this experimental car's front end and sculptured steel sides as indications of future company products

are developed for the different lines.

Cutoff Date Arrives—All through this period (normally from December to April or May) routings and layouts are subjected to hundreds of changes as designers make minor changes and results of tool and equipment tests roll in. But a month or two ahead of the actual changeover, a cutoff date is set and any further change must be recorded as a formal engineering change (ECR).

Mr. Timm says that all ECRs must be reviewed to see whether they still can be made before changeover, whether they should be made at all, or whether they should be made as running changes later in the model year. At the same time, final tooling deadlines are set and the initial production dates for different component lines are established. "We're never quite finished and it seems like we always have to devise some sort of temporary tooling or equipment to make parts until the production equipment arrives," he adds.

Lines Close Down — Finally, old models are phased out and the works engineering group changes and installs equipment. L. L. Scott, Buick's general works engineer, says he's using about 800 men to make the changeover and to catch up on routine maintenance.

This year, Mr. Scott's group is relocating and realigning a series of transfer machines on one of the engine block lines. Three 100-ton stamping presses will be installed in the fender and hood plant. Paint facilities are being repiped as Buick switches to Lucite lacquer. Mr. Scott explains that this calls for new pump and storage tanks and piping because Lucite paint must be kept circulating when it's not in use.

Easier changes will be made in the axle and transmission groups and in the service plant. As part of a continuing program, the fifth of Buick's eight foundry lines will be rebuilt.

Phasing In—The lines are phased in as they're completed. Forge and foundry groups are called back first. Assembly workers come last. Tools, machines, and the cars themselves are "debugged" in the next few weeks to catch any last-minute changes that can be made to keep production rolling when final assembly starts. This also gives the different lines a chance to build up floats of parts.

This year, Buick's retooling job is a relatively minor one, says Mr. Scott, although the product will be considerably different. During the changeover, Mr. Timm is collecting information on what tools and equipment will be needed to build 1960 Buicks.

U. S. Auto Output

Passenger Only

	1958	1957
January	489,357	642,090
February	392,112	571,098
March	357,049	578,826
April	316,503	549,239
May	349,474	531,365
June	337,353	500,271
6 Mo. Total	2,240,850	3,372,889
July		495,629
August		524,354
September		284,265
October		327,362
November		378,601
December		534,714
Total		6,117,814
Week Ended	1958	1957
June 7	73,696	129,517
June 14	78,163	125,372
June 21	84,396	118,805
June 28	92,277	125,909
July 5	34,240†	73,682
July 12	80,000*	111,943

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.

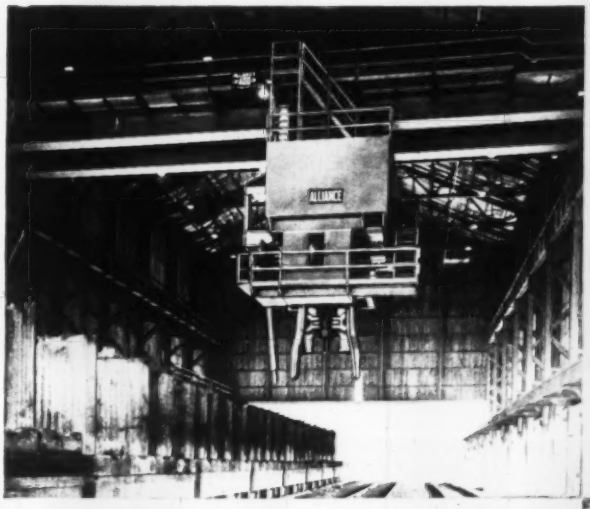
Bendix Builds Beeper

Bendix Aviation Corp.'s Detroit laboratory has developed a radar device for cars that will beep wildly whenever the vehicle comes too close to other autos or traffic hazards. The unit is not yet commercially available and Bendix figures it will cost about $200 when it can be mass produced.

The warning system's antenna is mounted in a car's front grille. Says Bendix: It send out signals which bounce back and are converted into audible beeps. Intensity of the sound depends on the nearness of the hazard.

Exhaust Notes

- Ford Motor Co. has been granted $1.4 million worth of contracts for development work associated with the installation of diesel engines in the Army's medium tank.
- National Automotive Fibres Inc. has closed its Findlay, Ohio, plant with no transfers of plant personnel. Operations reportedly are being shifted to Monterey, Calif., and Ontario facilities. National makes car interiors for Ford, Chrysler, and the Little Two.
- *Ward's Automotive Reports* says air spring installations on 1958 model cars will total less than 100,000 units or 2.5 per cent of the estimated 1958 car production.



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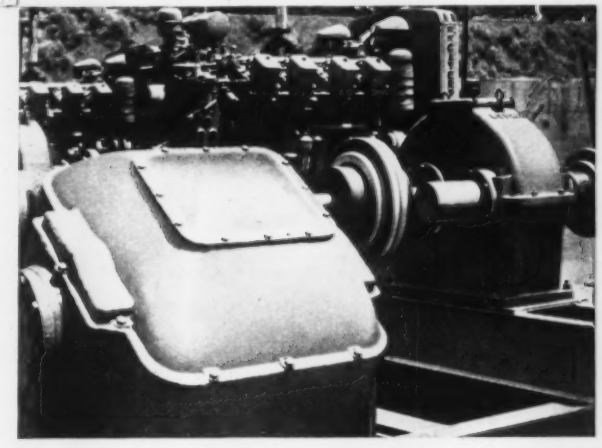
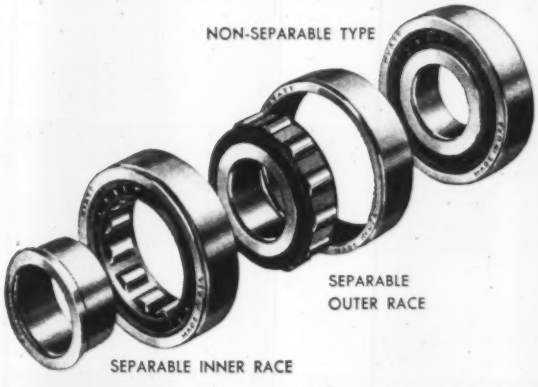
the more you need HYATTS . . . because you get more sheer load-carrying capacity with straight cylindrical roller bearings than with any other type. HYATTS give outstanding service in this 400-ton stripper crane.

THE HIGHER THE SPEED...

the more you need HYATTS . . . because carburized races, electronic control of eccentricity and internal clearances, and uncompromising final inspections assure smoother performance in speed reducers like this one.



THE MORE YOU NEED *Cylindrical* HY-ROLL BEARINGS



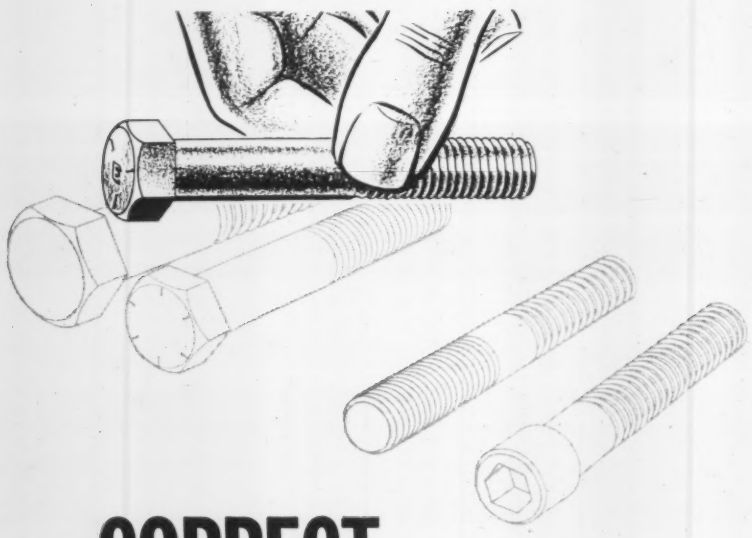
Loads are growing heavier, speeds are growing higher in many types of machinery today—and at the same time designers must often *reduce* overall size. Here's where HYATT Hy-Rolls have it all over limited-capacity bearings—especially when you eliminate either inner or outer races of separable HYATTS and operate the rollers directly on the hardened and ground shafts or housing bores. It's a smart way to save added space without sacrificing load capacity. Ask your nearest HYATT Sales Engineer for recommendations.
Hyatt Bearings Division, General Motors Corporation, Harrison, N.J.; Pittsburgh; Detroit; Chicago; and Oakland, California.

THE RECOGNIZED LEADER IN CYLINDRICAL BEARINGS

1908–1958 GM FORWARD FROM FIFTY

HYATT HY-ROLL BEARINGS FOR MODERN INDUSTRY

ECONOMIC FACTS ON FASTENERS



CORRECT FASTENER SELECTION AVOIDS COST PENALTY

- **A fastener survey can reveal many opportunities for savings**
- **Cut costs without cutting strength or safety of connection**

It's a mistake to pay premium prices for fastener properties you neither need nor use. While costly alloys have their place, most times the three grades of steel used in standard bolts and nuts can do the job and save money.

Example: Specification calls for alloy bolts with strength of 145,000 psi. But in assembly, they're tightened to just 30,000 psi. This gives no more strength to the joint than a *far more economical* Bright Cap Screw tightened to same load. The change would save a substantial sum.

Reducing size also saves. Remember that a fastener's job is to hold an assembly together. *Holding power* is what you should buy, rather than size or number of pieces.

Example: Product requires fasteners with a safe load capacity of 20,000 pounds. Bright cap screws of $\frac{3}{4}$ inch size will do it; but so will $\frac{5}{8}$ inch High Tensile Bolts—*at less cost*. Actually, to get the same holding power as in $1.00 worth of the high tensile fasteners, you would need $1.50 worth of bright cap screws.

All this just touches on a valuable story for any manufacturer using standard fasteners. Worth a call to hear what it holds for *you?* Contact Russell, Burdsall & Ward Bolt and Nut Company.

R B & W

114th year

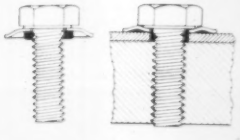
Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Fargo. **Distributors from coast to coast.**

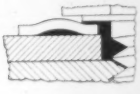
SPIN-SEAL* screws give leakproof fastening,

for flat or curved sheet materials

Here is a new type of composite fastener that seals by means of a unique flow-in sealant and washer.†

Concave in shape, the heat treated springy washer confines and controls the flow of sealing compound. Tightening the screw forces sealant into various spaces around (1) threads, (2) head, and (3) clearance hole to give hermetic sealing.





When screw is tightened the compound seals clearance hole and top thread; between washer and surface; between head and washer.

The washer has ability to conform to curved surfaces and still seal securely against hydrostatic pressures and wind driven water.

ONLY THE SCREW TURNS

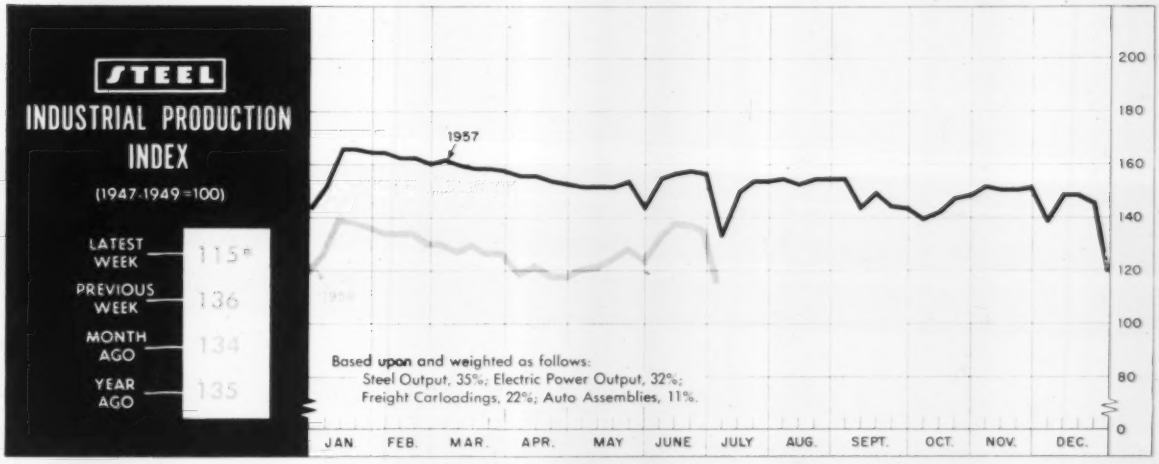
Washer does not turn with the screw. This prevents twisting or tearing the sealing "gasket", marring of polished surfaces, or gouging of painted finishes.

The flow-in gasketing compound is plastic rather than elastic. Stable and non aging, it won't split or ozone-check under pressure. It gives controlled flow into clearance spaces. Compounds are available to seal out water or oil.

Send for Bulletin SS-1A. *T.M.

† U.S. & Can. Pats. Pend.

RB&W FASTENERS—STRONG POINT OF ANY ASSEMBLY



*Week ended July 5.

Business Outlook Better in Second Half

THE SECOND HALF of 1958 is opening with a decidedly better business outlook than that of six months ago. The bottom of the recession is past and, with the exception of the summer slump, the uptrend from May and June is expected to carry over into early fall.

Reports from all over the country confirm the belief that the turn in business came in the middle of the second quarter. Many analysts argue that this does not constitute an end of the recession because the upturn was mostly seasonal. Others point out that if the recession were still in force, seasonal influences would not have prevailed to the extent indicated by STEEL's industrial production index above.

Indicators Split 50-50—The barometers published periodically on the following two pages show the switch in balance of ups and downs which has taken place in the last two or three months. On the basis of the latest information (mostly for May), 20 of the 45 indicators show an improvement from the preceding month, 20 show further decline, and five show no appreciable change. This compares with 11 ups, 28 downs, and six unchanged when the statistical series was tabulated in late April.

Of special significance is the change in the orders and sales data. In April, only three out of 11 series showed improvement from month-to-month. Today, seven are up, one is even, and only three are still declining. Production has improved along with new orders. Of the 20 series on shipments and production, nine show a month-to-month gain, nine show a loss, and three are unchanged. This compares with six plusses, 12 minuses, and three neutrals in April.

Confirmation—This over-all trend is seen most clearly in the Commerce Department's report on manufacturers' sales, orders, and inventories (see table and chart, Page 80). The upturn in durable goods sales (shipments) in May reversed a ten-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,459[1]	1,376	2,015
Electric Power Distributed (million kw-hr)	10,800[1]	11,757	11,056
Bituminous Coal Output (1000 tons)	8,940[1]	8,770	8,845
Crude Oil Production (daily avg—1000 bbl)	6,200[1]	6,373	6,952
Construction Volume (*ENR*—millions)	$466.3	$483.1	$483.6
Auto, Truck Output, U. S., Canada (*Ward's*)	44,775[1]	127,238	95,614
TRADE			
Freight Carloadings (1000 cars)	500[1]	627	535
Business Failures (Dun & Bradstreet)	335	290	271
Currency in Circulation (millions)[3]	$31,763	$30,975	$31,146
Dept. Store Sales (changes from year ago)[3]	−3%	−9%	+2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$26,048	$27,667	$25,761
Federal Gross Debt (billions)	$276.3	$276.3	$270.4
Bond Volume, NYSE (millions)	$19.2	$25.1	$18.7
Stocks Sales, NYSE (thousands of shares)	10,427	13,334	9,257
Loans and Investments (billions)[4]	$95.8	$96.0	$87.0
U. S. Govt. Obligations Held (billions)[4]	$32.6	$32.4	$24.9
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	239.15
STEEL's Nonferrous Metal Price Index[6]	196.0	197.6	217.0
All Commodities[7]	119.1[1]	119.1	117.4
Commodities Other than Farm & Foods[7]	125.2[1]	125.2	125.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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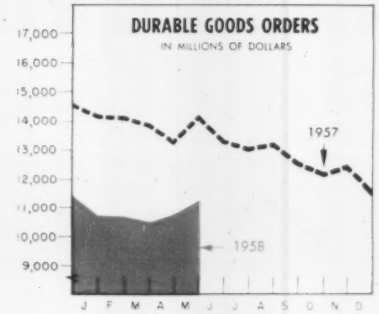
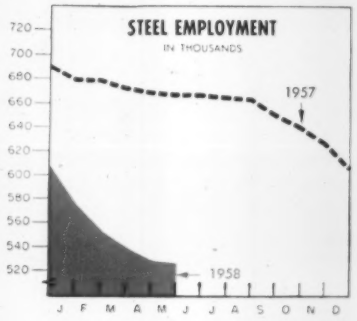
THE BUSINESS TREND



	New Orders* 1958	New Orders* 1957	Sales* 1958	Sales* 1957
Jan.	10,704	14,176	12,646	14,941
Feb.	10,688	14,102	12,038	14,808
Mar.	11,488	13,853	11,670	14,198
Apr.	10,800†	13,234	11,504†	14,254
May	11,300†	14,115	11,700†	14,296
June	.....	13,249	.....	14,207
July	.....	13,005	.....	14,573
Aug.	.....	13,160	.....	14,297
Sept.	.....	12,519	.....	14,132
Oct.	.....	12,154	.....	13,932
Nov.	.....	12,434	.....	13,548
Dec.	.....	11,399	.....	13,092

*Seasonally adjusted. †Preliminary.
U. S. Office of Business Economics.
Charts copyright, 1958, STEEL.



	Employment in Thousands 1958	Employment in Thousands 1957	Payroll in Millions 1958	Payroll in Millions 1957
Jan.	575	678	$297.4	$360.4
Feb.	554	677	261.7	327.5
Mar.	539	671	271.8	344.2
Apr.	529	668	259.1	331.5
May	527	666	270.1	338.0
June	...	666	.....	324.8
July	...	665	.....	334.6
Aug.	...	663	.....	343.7
Sept.	...	651	.....	330.1
Oct.	...	640	.....	345.6
Nov.	...	626	.....	316.3
Dec.	...	606	.....	299.6

American Iron & Steel Institute

month decline, and new orders rose by about $500 million over the April figure, seasonally adjusted.

All six backlog series are still declining, although the rate of decline in some cases has slowed down in response to more new orders.

Although prices continued to rise over the period of this tabulation, there has been some sign of a slowdown during June. Wages continue to rise, as indicated by the total payroll costs of the steel companies (see table above).

Bank Mildly Optimistic

The Guarantee Trust Co. of New York points to the improvements in manufacturing, construction, and retail trade as "legitimate grounds for at least moderate optimism as the second half gets underway, particularly since it is probable that increased governmental spending will give the economy an additional nudge as the year progresses." The bank feels that the economy has not hit a false bottom and that the recession low of the early spring will eventually give way to recovery.

The major block in the upward path, it points out, is the downtrend in capital spending. Because of this, recovery forces will have a significant drag to overcome. However, the vigorous recovery after the 1954 recession got underway before the decline in capital spending was arrested.

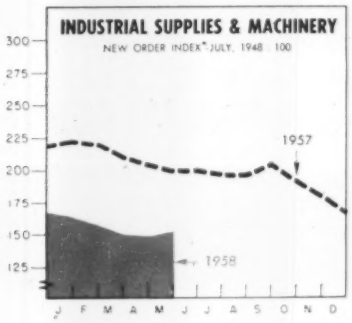
Dawson Sees Peak in '59

James Dawson, vice president and economist for Cleveland's National City Bank, feels that there is ample proof that this can happen again. In both of the postwar recessions (1948-49 and 1953-54), spending for plant and equipment hit its low point just two or three months before the industrial production index regained its prerecession peak.

He suggests that the prerecession peak this time could come during the third quarter of 1959. This would make the current recession a little longer than either of its predecessors. (It has already established itself as the deepest as far as manufacturing is concerned.) If previous patterns hold, corporate pretax profits will regain their peaks at about the same time as production does.

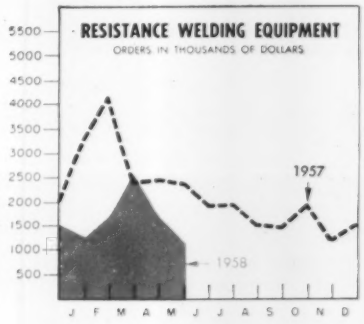
Holiday Cuts Production

STEEL's industrial production index dropped more than anticipated during the July 4 holiday week, but



	1958	1957	1956
Jan.	163	221	190
Feb.	157	219	190
Mar.	149	210	190
Apr.	148	203	195
May	152	199	199
June	...	199	197
July	...	197	203
Aug.	...	197	211
Sept.	...	203	203
Oct.	...	192	206
Nov.	...	180	220
Dec.	...	167	218

*Seasonally adjusted.
Amer. Supply & Machinery Mfrs.' Assn.



	Net Orders 1958	Net Orders 1957	Shipments 1958	Shipments 1957
Jan.	1,243	3,310	1,422	3,161
Feb.	1,683	4,161	1,615	2,386
Mar.	2,550	2,360	1,659	2,845
Apr.	1,684	2,429	1,963	3,111
May	1,121	2,340	1,750	2,891
June	....	1,936	....	2,735
July	....	1,943	....	3,194
Aug.	....	1,501	....	2,591
Sept.	....	1,463	....	2,528
Oct.	....	1,933	....	1,953
Nov.	....	1,167	....	2,227
Dec.	....	1,501	....	1,969
Totals	....	26,044	....	31,591

Resistance Welder Manufacturers Assn.

it practically paralleled the corresponding trend line for 1957 (see chart, Page 79).

While all segments declined, automotive production and output of electricity fell more than usual. Motordom turned out only about one third of the previous week's production, mostly because 19 of 23 General Motors Corp.'s plants shut down for the entire week, says *Ward's Automotive Reports*. While most plants returned to preholiday schedules on July 7, De Soto Div. of Chrysler Corp. joined GM's Buick Div. for model changeover. Dodge Div. is scheduled to shut down today for that purpose, and Chrysler-Imperial will halt on July 23. Pontiac, Oldsmobile, and Cadillac plants will phase out late this month or early in August, and Ford will go down in September. Little has been said about Chevrolet, the industry's No. 1 producer.

The cutbacks in the industrial use of electricity were too severe to be counterbalanced by the domestic use of air conditioners during the first real summer weather of the year for much of the nation. However, this segment of the index is expected to bounce back to nearly preholiday levels (about 11.7 billion kw-hr).

Steelmakers last week raised production schedules to about 53.5 per cent of capacity from the holiday week's level of 51 per cent, indicating that orders are still coming in at a fair pace. Output was about 1,445,000 net tons for ingots and castings.

Trends Fore and Aft

- Construction outlays in June rose seasonally to a little over $4.3 billion. This was up $322 million over May's total, but fell $49 million below the corresponding year-ago figure. Building in the first half of 1958 was slightly above the level of the year-ago period.
- Heavy construction awards for the first 27 weeks of this year are 2 per cent ahead of the corresponding total for 1957, reports *Engineering News-Record*.
- Billings for heat treating in May declined to $2,421,500, which is 28.6 per cent below the May, 1957, figure, says the Metal Treating Institute.
- Output of electric ranges in May rose over both the preceding month and May, 1957, states the National Electrical Manufacturers Association. May's total was 96,000 units compared with 95,600 in April and 93,600 in May, 1957.

Somers THIN STRIP ® 25,000:1 This fantastic ratio is possible only at Somers, where the latest equipment produces thin strip down to .001", as wide as 25".

With the installation of one of the largest Sendzimir mills in the non-ferrous industry, Somers is prepared to meet the broadest range of dimensional specifications, since it is already supplying thin strip down to .0001" in narrower widths.

Pure Nickel, Monel, Inconel and Inconel "X" are produced in gauges from .0001" to .020". Stainless Steel, electrolytic Copper and its alloys, such as Brass, Nickel Silver and Phosphor Bronze from .0001" to .010".

For a complete survey of your strip problems at no cost or obligation, write for field engineer or Confidential Data Blank.

Somers Brass Company, Inc.
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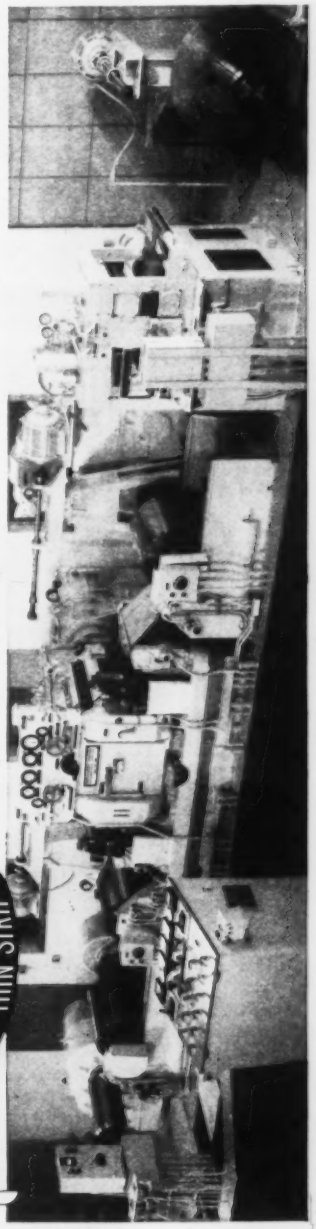

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DeWalt engineering director

J. SAMUEL ROBBINS
Vulcan Mold & Iron v. p.

ASTOR L. THURMAN
works mgr. for Connors Steel

JOHN W. BELANGER
gen. mgr. GE apparatus sales

Wilfred E. Walton was named director of engineering, **DeWalt Div.**, American Machine & Foundry Co., Lancaster, Pa., a newly created post. He has been with the government products group of AMF in Rochester, N. Y., where he directed engineering policy and technical effort.

J. Samuel Robbins was appointed vice president-operations for the Latrobe, Pa., and Chicago district plants of **Vulcan Mold & Iron Co.** Formerly Chicago district sales manager, he is now in Latrobe.

Bernard T. Brennan was elected president and chief executive officer of **Anti-Corrosive Metal Products Co. Inc.**, Castleton-on-Hudson, N. Y.

John Nash was appointed sales manager, Progress & Monitor Boiler Div., **Cleaver-Brooks Co.**, Milwaukee. He succeeds **Robert E. Sullivan,** who heads the Cleaver-Brooks sales agency in the Cleveland territory. Mr. Nash was sales manager, Petroleum Heat & Power Co.

A. A. Lanahan was promoted to purchasing agent, **Granite City Steel Co.**, Granite City, Ill. He was assistant to the purchasing agent, raw materials. He now serves as purchasing agent of the steelworks and blast furnace divisions.

Frank F. Black was appointed manager of the heavy chemical department of **Cowles Chemical Co.**, Cleveland. He will succeed **Earl F. Clark,** who retires at the end of July. Mr. Black continues as manager of the organic chemical department.

Astor L. Thurman was named manager of the West Virginia Works of **Connors Steel Div.**, H. K. Porter Company Inc. The plant is in Huntington, W. Va. Mr. Thurman was executive vice president of Mannesmann-Meer Engineering & Construction Co.

William T. Ylvisaker, recently made general manager, **Parker-Kalon Div.**, General American Transportation Corp., Clifton, N. J., was elected president. He succeeds **Louis Goldburg,** cofounder and president, who retired.

H. R. Wimmersberger, vice president, was elected president-treasurer of **Pittsburgh Tool Steel Wire Co.**, Monaca, Pa. He succeeds **Ralph H. Pauley**, retired.

Alco Products Inc., Schenectady, N. Y., realigning its field marketing organization, named three sales managers: **Paul W. Geisler,** thermal and petroleum industry equipment division; **Robert W. Pittman,** transportation products and services; **Robert H. Binkerd,** industrial equipment, spring and forge division.

A. Stewart Jr. was made manager, industrial department, **Nuclear Metals Div.**, National Lead Co., New York. He is in charge of the new Albany, N. Y., facility. He was assistant plant manager for National Lead of Ohio in Fernald, Ohio, operated for the Atomic Energy Commission.

William R. Stock was named superintendent of **Shenango Furnace Co.'s** foundry, Sharpsville, Pa.

John W. Belanger was made general manager of **General Electric Co.'s** apparatus sales division, New York. Mr. Belanger, a GE vice president, succeeds the late **William V. O'Brien.** He has been associated with the apparatus and industrial group since its formation in April as a combination of the former apparatus group and industrial components and materials group.

Robert C. Remington was made sales manager, **Hufford Corp.**, division of Siegler Corp., Los Angeles.

Paul L. Tietjen was promoted to general manager, traffic and transportation, **Jones & Laughlin Steel Corp.**, Pittsburgh. He replaces **Clem W. Gottschalk,** retired. **Calvin F. Coombs** succeeds Mr. Tietjen as manager, traffic and transportation division.

L. B. Smith was appointed executive engineer for **AC Spark Plug Div.**, Flint, Mich., General Motors Corp. He succeeds **C. G. Davey,** retired.

Frank J. French was made vice president, general chemical division, **Allied Chemical Corp.**, New York. Former director of purchases, he now is in charge of the division's production, mining, purchasing, and industrial service activities.

Moffett Engineering Inc., Albany, Calif., elected **Will C. Hall** president and general manager. He was president of Pacific Coast Engineering.

Fred A. Brinker was made assistant vice president, **Vanadium Corp. of**

DONALD C. DUVALL ROBERT E. LAUTERBACH
executive posts at Pittsburgh Steel

W. A. BLOMSTRAN JOHN R. WALL
Republic Steel positions

America, New York. He was chief metallurgist, western division.

Donald C. Duvall was elected executive vice president, **Pittsburgh Steel Co.**, Pittsburgh. He was assistant to the president and vice president-industrial relations. **Robert E. Lauterbach**, former secretary, was made vice president-administration and planning, a new post. **Richard McL. Hillman**, vice president-treasurer, is now vice president-secretary and treasurer. **James S. Howard** is assistant secretary-treasurer.

Westinghouse Electric Corp. named **P. T. Lagrone** manager, New Orleans district, apparatus division. He is succeeded as manager, electric utility sales department in Pittsburgh by **C. W. Mills**, former Chicago area sales manager, apparatus division.

Lewis B. Hoagland, effective Sept. 1, succeeds **Paul J. Breting** as purchasing agent of **Rheem Automotive Co.**, Fullerton, Calif.

William S. Hutchings was made assistant manager of purchasing, **New Jersey Zinc Co.**, New York, to succeed **A. E. Turner**, retired. **Kenneth C. Lippmann** was made manager of transportation, succeeding **K. L. R. Baird**, general traffic manager, who retires Aug. 1.

Douglas C. Vest was elected vice president - research, development, and engineering, **Redel Inc.**, Anaheim, Calif.

Charles H. Benbrook was made new product development director, **Ozalid Div.**, General Aniline & Film Corp., New York. He was director of research.

W. A. Blomstran was made manager of **Republic Steel Corp.'s** Port Henry, N. Y., mining district to succeed **Francis J. Myers**, retired. **John R. Wall** was named general traffic manager for the corporation, Cleveland. He succeeds **R. A. Eldridge**, who asked to be relieved of some of his duties because of ill health. Mr. Wall was assistant general traffic manager.

Harold S. Davis was made sales manager, **DataTape Div.**, Consolidated Electrodynamics Corp., Pasadena, Calif. He was marketing manager at American Electronics Inc.

W. J. Vogel was made general manager of **Reynolds Metals Co.'s** new plastics sales division at Richmond, Va. He was manager of Reynolds' plastics plant at Grottoes, Va., and also directed sales operations from there. He is succeeded by **Richard M. Chamberlin**, former assistant manager.

Nathaniel D. Grasty joined **Eastern Stainless Steel Corp.**, Baltimore, as assistant to the sales promotion manager. He retired recently as advertising manager for Crown Cork & Seal Co.

James P. Kelleher was made manager of sales, **Alpha Plastics Inc.**, Livingston, N. J. He was with Alloy Tube Div., Carpenter Steel Co.

Oscar M. Dull Jr. fills the new post of director of industrial relations at E. F. Hauserman Co., Cleveland.

Otto H. Wilhelm was made Columbus, Ohio, district manager, NCG Div., **Chemetron Corp.**, to succeed the late **C. A. Clark**. He is replaced as district manager at McKees Rocks, Pa., by **A. D. Fischer. Charles H. Diment** replaces Mr. Fischer as Cincinnati district manager.

Kenneth B. Wood Jr. was made assistant manager-lubricant development, **Climax Molybdenum Co.**, division of American Metal Climax Inc., New York.

W. W. Holloway Jr. was named assistant to the director of purchases, **Wheeling Steel Corp.**, Wheeling, W. Va.

Michigan division of **Revere Copper & Brass Inc.**, Detroit, appointed as managers: **G. John Gamber**, merchandise sales; **Weston Jenkins**, industrial sales; **John M. Walker**, aluminum sales.

Geery B. Brown was appointed district manager, eastern region, **Wells Industries Corp.**, with headquarters in Garden City, N. Y. He was with Greer Hydraulics Inc. **Robert F. Parker** was made defense products liaison engineer. He is at the main plant in North Hollywood, Calif.

C. F. Heiberger was made central area manager-manufacture, **Canco Div.**, American Can Co., in Chicago. He succeeds **W. F. May**, who transfers to New York as national sales manager of processed food containers.

John C. Pelham was made sales manager, structural steel department, **Fabricators Steel Corp.**, Bladensburg, Md.

Reed D. O'Connell fills the new post of supervisor of union relations at **Armco Steel Corp.'s** Baltimore

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"Grade Mark Service" for alloy steels...

gives you fast, accurate identification of stock!

"Grade Mark Service" is a bonus to alloy steel buyers. It means faster identification, speedier handling and better stock control of alloy steels purchased from U. S. Steel Supply.

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These bundles are steel-strapped, too—firmly and securely bound with USS Gerrard* Steel Strapping.

This adds up to: **1. Instant and positive identification of material on your receiving floor. 2. Safe and easy-to-handle bundles.**

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A test report and a heat-treatment guide are mailed to you with each lot of alloy steel you purchase. The test report gives you the actual chemistry, mechanical properties, or the hardenability together with the guaranteed minimum hardenability. The heat-treatment guide gives the recommended heat-treating and working temperatures.

Our "Grade Mark Service" for alloy steels includes: USS* Carilloy alloy steels —hot-rolled rounds, cold-finished rounds, squares, hexagons, "FC" (Free-Cutting) rounds; USS Carilloy* Aircraft Quality hot-rolled rounds and flats and cold-finished rounds, squares, hexagons, flats.

Here is an improved method of bundling and marking shipments of alloy steels. Why not see how you can benefit from "Grade Mark Service"? Call your local U. S. Steel Supply warehouse the next time you need alloy steel.

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MITCHELL P. KARTALIA
Square D gen. mgr.-marketing

W. W. HARRIS
Roots-Connersville v. p.

S. L. CRAWSHAW
Philadelphia Gear v. p.

ALBERT L. FAIRLEY JR.
executive v. p. at Dosco

FRANK J. STRNAD
Link-Belt Speeder chief eng.

ANDREW ZMUDA
Norgren chief engineer

Works. He was senior industrial engineer there.

Albert L. Fairley Jr. was elected executive vice president, **Dominion Steel & Coal Corp. Ltd.**, Montreal, Que., effective Aug. 15. He will also serve as executive vice president of the subsidiaries: Dominion Coal Co. Ltd., and Nova Scotia Steel & Coal Co. Ltd. Dosco was acquired last fall by A. V. Roe Canada Ltd. Since Nov. 1, 1957, **A. C. McDonald**, executive vice president-industrial, A. V. Roe Canada, has been operating chief of Dosco, serving as chairman of the management committee.

Harry C. Schaaf, plant superintendent, succeeds **Howard M. Sweeney**, retired, as vice president-general manager, **Union Drawn Steel Co. Ltd.**, Hamilton, Ont., Republic Steel Corp.

Marshall C. Shields was named Chicago district sales manager of the new stainless and strip division of **Jones & Laughlin Steel Corp.** **John I. Collins** was made assistant district sales manager.

Frank J. Strnad succeeds **Harold F. Allen**, retired, as chief engineer, **Link-Belt Speeder Corp.**, subsidiary of Link-Belt Co., Chicago. He was assistant chief engineer.

Andrew Zmuda, formerly director of research at DeVilbiss Co., joined **C. A. Norgren Co.**, Englewood, Colo., as chief engineer. **Morley V. Freidell** was made supervisor of the new research and development section. **Ralph C. Baker** was made engineering laboratory supervisor. **Kirk Carlsten** was made product design and drafting supervisor.

Gayle Lewis was made midwest district sales manager, **Circle Wire & Cable Corp.**, subsidiary of Cerro de Pasco Corp.

David P. Wroten was made southeastern district manager, Atlanta, for **W-S Fittings Works**, Forge & Fittings Div., H. K. Porter Company Inc.

Josh Gershuny was made sales manager, Electropoint Div., **Electrosystems Inc.**, subsidiary of Royal Industries Inc., Alhambra, Calif.

Mitchell P. Kartalia was appointed general manager-marketing division, **Square D Co.**, Detroit, effective Aug. 1. He succeeds **Frank Roby**, resigned. Mr. Kartalia was sales manager, distribution equipment.

Roots-Connersville Blower Div., Dresser Industries Inc., Connersville, Ind., appointed **W. W. Harris** vice president-marketing. He was with General Electric Co.

S. L. Crawshaw was elected a vice president, **Philadelphia Gear Corp.**, Philadelphia. He will direct the new high precision gear grinding.

OBITUARIES...

Herman A. DePova, 52, works manager, **Midvale - Heppenstall Co.**, Philadelphia, died June 27.

Henry G. Riter III, 65, honorary chairman, **Copperweld Steel Co.**, Pittsburgh, died June 30.

Rufus L. Batteiger, 74, president, **Coatesville Plate Washer Co.**, Philadelphia, died June 29.

Melvin Emrick, 48, chairman, **Ettco Tool & Machine Inc.**, Brooklyn, N. Y., died June 30.

Jay T. Osler, 73, retired chairman, **Continental Foundry & Machine Co.**, died in Florida July 4.

John D. Joyce, sales engineer for **Loftus Engineering Corp.**, Pittsburgh, died June 18.

Milton Greenberger, chairman, **Steel Mill Products Co. Inc.**, Chicago, died June 25.

L. J. Bulkley, 63, president, **Commonwealth Brass Corp.**, Detroit, died June 22.

Reynolds R. Perry, 51, a vice president, **Harris-Seybold Div.**, Cleveland, Harris-Intertype Corp., died June 29.

Clayton F. Drake, 52, a salesman in the Cincinnati office of **Armco Steel Corp.**, died June 25.

John J. Delaney, 62, general manager, **Reliance Regulator Div.**, Alhambra, Calif., American Meter Co., died June 10.

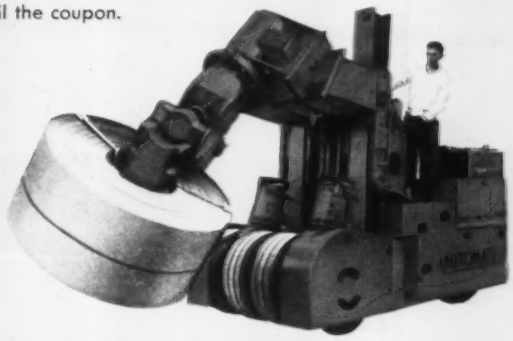
C. W. Ruth, 66, former director of advertising, **Republic Steel Corp.**, Cleveland, died July 6.

BEST OF THE HEAVIES...

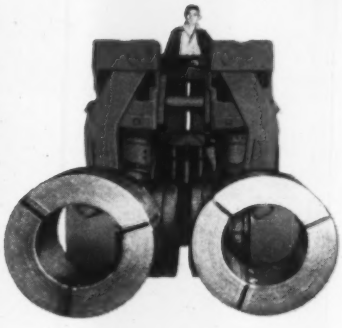
SERIES MF-ELBOLIFT: Works on leverage principle new to lift truck design... eliminates entire mast assembly. Carrying a load of 15,000 lbs., the Elbolift passes easily through any 78" boxcar door... will right-angle stack a 52" long load up to 120" high comfortably in a 13' 8" aisle. CAPACITIES: 12,000 to 20,000 pounds.

Automatic...
Most Complete Line of Steel and Die Handling Equipment
Capacities up to 110,000 lbs. or more

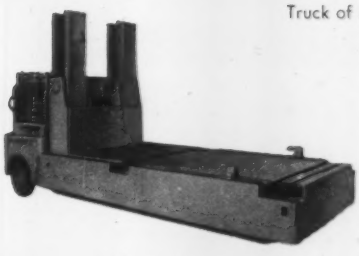
In the heavyweight division of materials handling, no other line matches the versatility and range of Automatic's heavy duty trucks. This is the direct result of many years of specialized engineering and manufacturing experience in the coil and die handling field. The five examples shown here comprise only a small sampling of the wide range of heavy duty handling requirements served by Automatic equipment. So don't hesitate to call us in on any problem involving weights up to any practical limit. No obligation, of course. Just mail the coupon.



COIL-UPENDER ATTACHMENT: Picks up coil in vertical position and rotates to horizontal or vice versa. Holds coil securely throughout rotation... prevents telescoping. Handles up to 60,000 lbs. Now available on Automatic HR Series or as an attachment for any Automatic Truck of suitable design and capacity.



SKYLIFT GIANT: Heavy duty mast type truck available with either forks or ram. Model shown here has split ram to handle either 1 or 2 coils at a time. CAPACITIES: 20,000 through 80,000 pounds or more.



SERIES TLO: First heavy duty die handlers ever made with completely hydraulic loading, unloading and lift. Bullards move much faster and smoother than in any mechanical system... unloads at end or either side to meet any requirements of space and accessibility. CAPACITIES: 4,000 to 110,000 pounds or more.

MODEL TLO-10: Shortest, most compact 20,000 pound die-handler made... fastest, easiest to maneuver, especially in narrow aisles. Hydraulically operated lift, loading and unloading.

Automatic Electric Industrial Trucks Cost Less to Own... Less to Operate

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MODELS.....

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Firm.....

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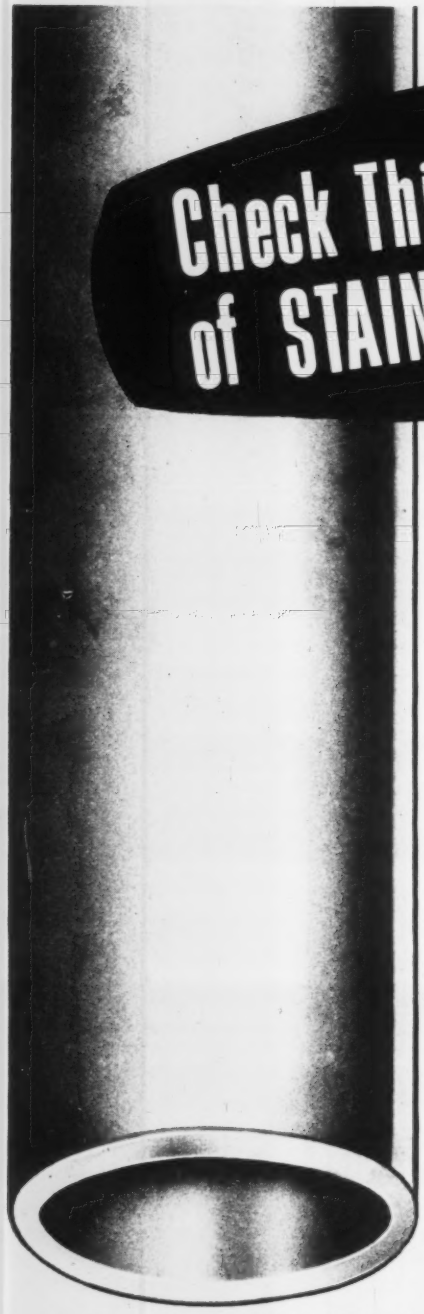
City & Zone.....*State*.....



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MANY YEARS of performance are behind Wall Tube's tradition of top quality and dependable delivery. From a standpoint of product excellence, of economy or reliability . . . Wall Tube can be a significant addition to your sources of supply. Write today for our new catalog, "STAINLESS STEEL TUBING FOR INDUSTRY."

STAINLESS STEEL TUBING RANGE OF MANUFACTURE

Welded and Cold Drawn:

1¼" OD to 3/32" OD .083" to .008" walls.

Seamless:

⅝" OD to 3/32" OD .049" to .008" walls.

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STEEL SERVICE CENTERS

AMERICAN STEEL WAREHOUSE ASS'N

ARE DOING A JOB FOR YOU!

Ormet Opens Alumina Plant

Production will reach 345,000-ton annual rate soon. Firm's primary metal output climbs

ALUMINA production has started at the Burnside, La., plant of Ormet Corp., the nation's fourth largest aluminum producer.

Upon completion of the $55-million plant's second alumina producing unit late this summer, output will reach 345,000 tons per year. Ormet's second production facility, a $110-million aluminum reduction plant near Clarington, Ohio, is operating.

Co-operation—Owned jointly by Olin Mathieson Chemical Corp. and Revere Copper & Brass Inc., Ormet was formed in August, 1956, to supply primary aluminum to the two companies.

Burnside alumina will be transported to the Omal, Ohio, reduction plant by barge. When in full operation late this year, the plant will turn out 180,000 tons of primary aluminum per year.

Competition — The joint effort stops at the end of the ingot line; the companies become competitors in the production and sale of finished aluminum.

Olin Mathieson will receive two-thirds (120,000 tons) of Ormet's annual production, the majority of which will be used in Olin's nearly completed rolling mill near the Ohio reduction plant.

Revere's 60,000 tons will be fabricated in Baltimore and Chicago.

Expands Tin Plate Mill

Inland Steel Co., Chicago, is boosting its tin plate production capacity by more than 60 per cent. The project will enable Inland to treat two-thirds of all its tin mill products by continuous annealing and to deliver the metal in coils to canmakers who use it in that form.

Major items of the expansion program are:

An electrolytic tinning line of 165,000 tons annual capacity that can turn out tin plate in coils or sheared to length up to 46 in. It will bring the company's annual capacity to 435,000 tons of tin plate.

A continuous annealing line of 165,000 tons annual capacity, making Inland's new capacity 300,000 tons a year.

A new temper mill with an annual capacity of 350,000 tons.

New coiling equipment for one of the company's continuous hot strip mills and new coil handling equipment for a cold strip mill.

No estimate of the separate cost of the tin mill project is available. The total of unexpended appropriations for capital projects is now $125 million, including the tin mill program and related steps.

The company has completed major phases of a three-year $280-million expansion program and expects to have total capital outlays of about $100 million this year, second only to the $130 million expended in 1957.

Ends Foundry Operations

Buflovak Equipment Div., Blaw-Knox Co., has shut down its foundry operations at Buffalo to make additional space available for fabricating activities. The foundry made castings primarily for the Buffalo plant which makes processing equipment. The division has received a large order from the firm's Foundry & Mill Machinery Div. for work on steel mill tables.

U. S. Steel Forms Divisions

Universal Atlas Cement Co., Union Supply Co., and Homewood Stores Co., wholly owned subsidiaries of United States Steel Corp., are now being operated as divisions of the parent company. Charles B. Baker is president of Universal Atlas; David H. Boyd, Union Supply and Homewood Stores.

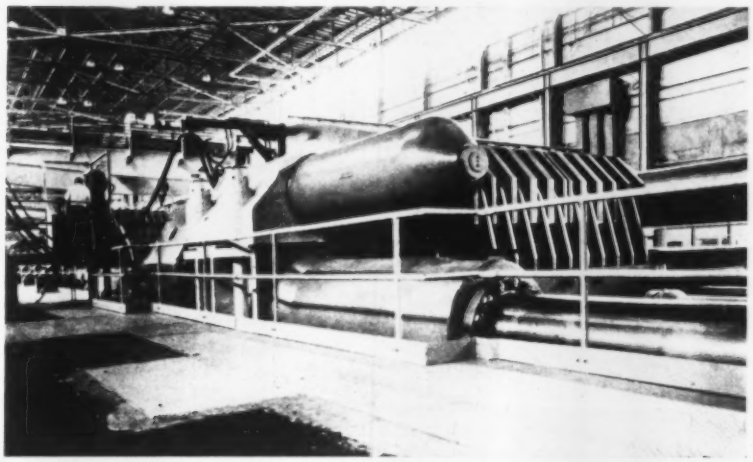
Buys Wink Cutter Div.

Motch & Merryweather Co., Cleveland, acquired the Wink Cutter Div. from F. J. Fink & Co., Chardon, Ohio. The Wink cutter is a high speed precision machine used for cutting rubber, plastic, textile fiber, and many other extruded materials at fast speeds. Frank J. Fink is manager of the Wink Cutter Div.

Opens $18-Million Mill

American Brass Co., Waterbury, Conn., formally opened its $18-million brass mill at Paramount, Calif. The plant produces copper, brass, and bronze in the form of tubing, sheets, strip, rods, drawn products, and special shapes. Annual rated capacity: 30 million lb. C. Russell Epley is vice president in charge of

(*Please turn to Page* 92)



THIS PLATE STRETCHER has been installed at Aluminum Co. of America's plant, Davenport, Iowa. It is 160 ft long and weighs more than 2750 tons. Six-inch plate, 152 in. wide, gripped between the massive jaws of this press, can be straightened with a speed of 2 fpm. It has a pulling force of 16 million lb. The builder, Loewy-Hydropress Div. of Baldwin-Lima-Hamilton Corp., claims this is the widest stretcher for aluminum plate ever built

integrated CRUCIBLE steel service

Orders for specialty steels go out fast — usually overnight or even earlier — from *local* Crucible warehouses. That's because each warehouse has a wide variety of grades and sizes on hand, *at all times.*

gives you local stocks of 16,000 specialty steel items for immediate delivery

Within minutes, the Crucible inside account salesman can tell you if the grades, sizes and quantities you need are available. He'll check his customer's master file for your delivery requirements, billing details, etc. And then he'll quickly arrange for cutting to meet customer's requirements. So deliveries are swift and sure.

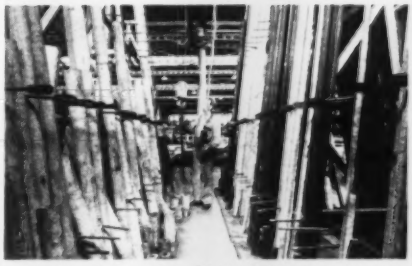
This combination of large local stocks and warehouse efficiency means you can fill even the most varied or unusual requisitions for specialty steels with a single phone call.

It's a basic reason why purchasing agents who *depend* on local sources call Crucible *first* – like this one:

"We're basically a tool and die 'job' shop. We never know what steel we'll be using from one day to the next. So whatever we need, we need fast. It has been our experience that it saves time to call the Crucible warehouse first."

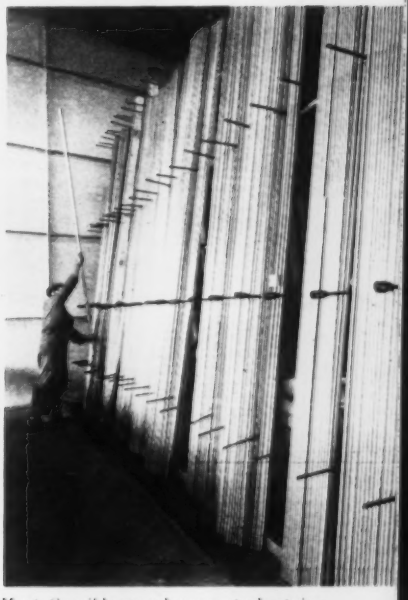
Why not simplify and speed up your specialty steel purchases by relying on your local Crucible warehouse? The advantages of Crucible's entire integrated operation, from mining the ore to steelmaking and warehouse delivery, are all available through the nearby source. *Crucible Steel Company of America, Dept. PG15, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

Keep up-to-date on the specialty steels available — when they're available! Ask your local Crucible warehouse to send you its monthly stock list.



Local warehouse can fill both large and small orders from stocks like these of hollow tool steel sections and solid rounds.

Die casting die steels and plastic mold steels stand ready for cutting to order and immediate delivery.



Most Crucible warehouses stock stainless bars — stack them upright in "A" racks to protect the surfaces.

TOOL STEELS – Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollows, forgings and flat ground stocks

HIGH SPEED STEELS – Crucible's famous "Rex" steels: Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits

STAINLESS STEELS – Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles

MACHINERY STEELS – Crucible Max-El rounds, hexagons, plates and brake die steel

ALLOY STEELS – Bars, billets, strip and sheet

COLD ROLLED CARBON SPRING STEELS

DRILL STEELS – Wing or section twisted augur drill steels, hollow and solid drill steels

ALUMINUM EXTRUSION DIE STEELS
HOLLOW TOOL STEEL
WELDING AND HARD FACING ROD
PLASTIC MOLD STEELS
PERMANENT MAGNETS

— and many others

Need stainless sheet? The local warehouse stocks most types, finishes and sizes for prompt delivery to you.

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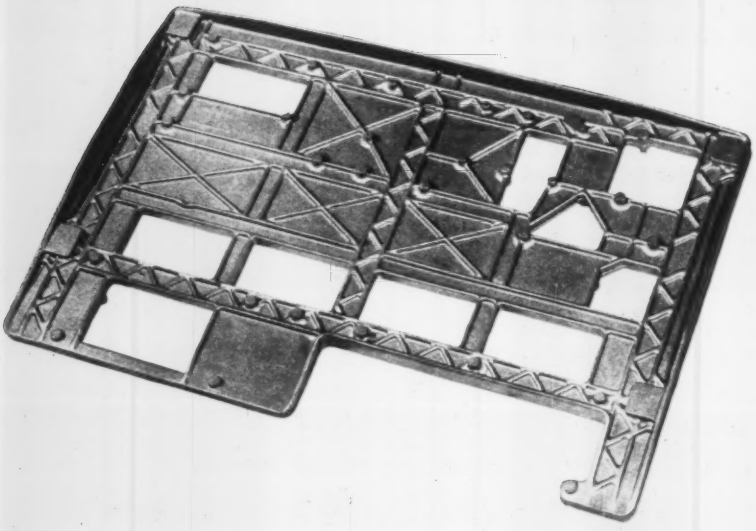

DUCTILITY

A CASE IN POINT—This ninety-six pound casting was made for the National Cash Register Co. of Nodulite®, Hamilton Foundry's ductile iron. The casting forms the base for the new Post-Tronic Accounting Machine. It measures 37½" by 23½" with sections varying from ¼" to 1½". Ductile iron was chosen for this part because of its ductility, dimensional stability, rigidity, and machinability.

Ductile iron has most of the engineering advantages of steel yet it can be designed with the same flexibility and cast with the same procedures used for gray iron. It has high strength: up to 120,000 psi minimum tensile strength in standard grades. It is tough: Charpy impact strengths up to 115 ft.-lbs. in standard grades. It is ductile: elongation is possible up to 25% after short time annealing. And it is wear resistant: spheroidal graphite particles provide for self-lubrication. Hamilton Foundry regularly casts 60-45-10, 80-60-03, 100-70-03, and 120-90-02 grades of ductile iron as well as high alloy Ductile Ni-Resist.

When new and unusual design problems arise in the selection of metal and the casting of parts, you will find that the skill and integrity of your foundry is your best insurance that specifications—and delivery schedules—will be met.

GRAY IRON • ALLOYED IRON • MEEHANITE® • DUCTILE (NODULAR) IRON • NI-RESIST • DUCTILE NI-RESIST • NI-HARD

HAMILTON FOUNDRY

The Hamilton Foundry & Machine Co., 1551 Lincoln Ave., Hamilton, Ohio • TW 5-7491

(*Concluded from Page 89*)

the Los Angeles Div.; H. Allison Buckbee, western sales manager. American Brass is a wholly owned subsidiary of Anaconda Co., New York.

Alco Rearranges Plant

Alco Products Inc. is completing a rearrangement of its plant at Dunkirk, N. Y., which will result in halting production in one building which covers 122,000 sq ft of floor space. Some of the operations which formerly were conducted in this building are being shifted to the machine and plate shops.

Opens Analytical Lab

Electro Metallurgical Co., a division of Union Carbide Corp., has placed in full operation its new Research & Development Analytical Laboratory at Niagara Falls, N. Y. The facility analyzes all materials used in the Product & Process Development Dept. and the Metals Research Laboratories of the Technology Dept. of the division. It will also do research on new analytical procedures.

Saco-Lowell Expanding

Saco-Lowell Shops, Boston, will construct 25,000 sq ft additions to its plants at Sanford, N. C., and Easley, S. C., to provide space for rehousing additional departments of the textile machinery operations now in Maine. Production of automotive parts and mufflers will be combined into a newly formed Automotive Div. with headquarters in the Edwards plant, Saco, Maine.

Olin Consolidates Units

Olin Mathieson Chemical Corp., New York, has consolidated its operating units into seven industrial divisions. Eleven former divisions have been integrated into four new divisions while the Squibb, Winchester-Western, and International divisions continue under their present organization structure. The four new divisions and the vice presidents appointed to head them are: Chemicals, Edward Block; Metals, Jess E. Williams; Packaging, Robert H. Evans; and Energy, Carroll

Inspection of 75-foot Salem Rotary Hearth Furnace at The Timken Roller Bearing Company plant at Canton, Ohio.

Rotary hearth roof of B&W IFB gives nine years of service at the Timken Company

Installed as a replacement for a super-duty firebrick sprung arch, over 35,000 B&W Insulating Firebrick were used in the roof of this rotary hearth furnace. Since installation nine years ago, just 300 9″ equivalents have been used for maintenance—less than 1% replacement!

Throughout this period the furnace has been operated at temperatures ranging from 2100 F to 2300 F on a continuous 6-day cycle at an average output of 20 tons per hour.

In addition to long service life, light-weight B&W Insulating Firebrick provide high fuel savings because of their low heat flow and heat storage. Light-weight IFB also simplify original furnace construction...make maintenance and patching easier.

For more information on long-lasting, cost cutting B&W Insulating Firebrick, consult your B&W Refractories Representative or send for Bulletin R-2-H.

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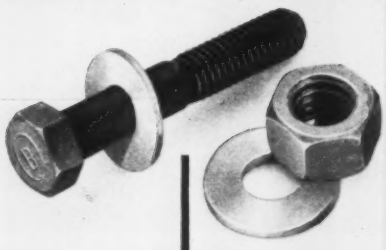
B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars • B&W Silicon Carbide • B&W Ramming Mixes • B&W Kaowool

R-598

BEFORE...

Separate Bolts, Nuts and Washers complicate inventories, increase assembly costs.



AFTER...

Washers as integral parts of bolts and nuts eliminate problems, speed assembly at lower cost.

Save Money

by simplifying fastener design

Here is a simple application of a basic bolt making principle which is affecting substantial savings for a number of manufacturers.

These savings, resulting from simplified design, are realized in every step of the operation from lower first cost of the fasteners through inventory to final assembly. Totalled, they are well worth while.

There are many other basic principles . . . often overlooked in designing and specifying fasteners, which are of importance cost-wise.

You'll find them in our new booklet, "How to specify fasteners . . . and save". Filled with drawings and charts, it makes a handy guide in designing or buying any headed parts.

If you can use a copy, write to North Tonawanda or ask a Field Representative.

BUFFALO BOLT COMPANY

Division of Buffalo-Eclipse Corporation

North Tonawanda, N. Y. • Princeton, Illinois

MAKING BOTH FASTENERS AND FRIENDS FOR 100 YEARS

● *3 convenient service centers*

WESTERN OFFICE Chicago HArrison 7-2178 | **EASTERN OFFICE** New York City REctor 2-1888 | **CENTRAL OFFICE** North Tonawanda JAckson 2400 (Buffalo)

Copps. Walter F. O'Connel assumes the responsibility of vice president for finance. Russell Hopkinson has been appointed vice president for commercial development.

Shifts Engineering Unit

U. S. Steel Corp.'s American Bridge Div. at Birmingham has taken over the engineering services of the company's Roanoke, Va., office. W. K. McGrath is district engineer for the combined operation.

Opens Jacksonville Unit

Reynolds Aluminum Supply Co. (formerly Southern States Iron Roofing Co.), Atlanta, established a complete warehouse operation at 1612 E. Eighth St., Jacksonville, Fla. Its inventory will include: Aluminum, galvanized and stainless steels, copper industrial metals, aluminum and steel roofing, insulation products, awning supplies, and many other building products. Leo Sheridan is directing the Jacksonville sales efforts.

Salem-Brosius Diversifies

Salem-Brosius Inc., Pittsburgh, plans to enter the atomic industry hardware field through the acquisition of Alloy Mfg. Co. Inc., that city. Salem-Brosius makes furnaces, material handling equipment, and mechanical devices. Alloy Mfg. specializes in the precision fabrication of stainless steels, nickel, and other metals.

Salem-Brosius also announces the acquisition of world rights to the new Belle Fons process for the reclamation of spent pickle liquor. A license agreement has been signed with the Pantech engineers of Oil City, Pa.

Fabricator Plans Changes

To improve efficiency and its competitive position, Youngstown Kitchens Div., American Radiator & Standard Sanitary Corp., will concentrate production of kitchens at its Warren, Ohio, plant next fall. Contract stamping and tool and die making will continue at Salem, Ohio. The division is considering moving general offices to Warren.

Appointments to key positions are: M. L. Condo, vice president

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We GUARANTEE your complete satisfaction with the bacteria resistance of Dasco D-20, or any of the Stuart soluble oils listed at the bottom of this page, on a 100 per cent money back basis.

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DETROIT, MICH. ..... Tyler 7-8500
HARTFORD, CONN. ..... Jackson 7-1144
PHILADELPHIA, PA. ..... Devonshire 8-6100
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Stuart

METALWORKING LUBRICANTS

Ever analyze the real cost of letting cutting oils turn rancid? Action of a sufficient quantity of bacteria to turn a coolant tank sour actually destroys the stability of the emulsion, shortens service life, and requires extra man-hours to aerate your machines. Stuart's new heavy-duty soluble oil, Dasco D-20, not only inhibits bacteria growth, but gives you better-than-average performance on a variety of machining operations. It can be used at different dilutions for both cutting and grinding. At no extra cost, you get a top-quality EP base and "ABI" additive that is GUARANTEED to keep the emulsion stable and sweet *three* to *four* times longer than other mixtures. Phone your Stuart service center or write the factory for complete information or a test sample of Dasco D-20.

WRITE FOR NEW FREE BOOKLET

Gives you typical results made possible by Dasco D-20 on broaching, turning, reaming, drilling, grinding, tapping, and threading operations. Describes how one automotive plant saved $7200 per month by using Dasco D-20 in 365 different machines.

SOLVOL "X" • DASCO D-20
CODOL "X" • DASCO SUPER-SOLUBLE "X" BASE

T-J spacemaker cylinder

Quality Engineered

to give quality results

with Extras . . .
at No Extra Cost!

You get more—much more—when you specify and use any of T-J's complete line of Spacemaker cylinders. The Spacemaker is engineered to give you better, more accurate, and longer service—offers, exclusively, many extras . . . that are STANDARD, AT NO EXTRA COST!

Designed to eliminate tie-rods, providing greater strength . . . saves space . . . reduces manhours and costs in all push-pull-lift operations. IMMEDIATE SHIPMENT in a wide range of styles and capacities, with 64,000 combinations. Write for Bulletin SM 155-3 with complete engineering details. The Tomkins-Johnson Co., Jackson, Mich.

METAL PISTON ROD SCRAPER . . . Standard at No Extra Cost!

NEW "SUPER" CUSHION FOR AIR . . . Standard at No Extra Cost!

CHROME PLATED CYLINDER BORES AND PISTON RODS . . . Standard at No Extra Cost!

ONE PIECE PISTON . . . Standard at No Extra Cost!

NEW "SELF-ALIGNING" MASTER CUSHION FOR HYDRAULIC USE . . . Standard at No Extra Cost!

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FORGED SOLID STEEL HEADS . . . Standard at No Extra Cost!

T-J TOMKINS-JOHNSON
RIVITORS . AIR AND HYDRAULIC CYLINDERS . CUTTERS . CLINCHORS

of product development; H. F. Howell, vice president-marketing; H. O. Smith, vice president and general manager of contract stamping; Carl Eversman, manager of kitchen equipment manufacturing; John Spier, controller; F. L. Maus, manager of industrial relations.

ASSOCIATIONS

Drop Forging Association, Cleveland, elected these officers: President, Gordon R. Walker, Walker Forge Inc., Racine, Wis.; vice president, L. M. Fehrenbach, Indianapolis Drop Forging Co. Inc., Indianapolis; executive vice president, secretary, and treasurer, Dwight M. Allgood.

Officers elected by the **Resistance Welding Alloy Association,** Philadelphia, are: President, J. A. O'Grady, Weldaloy Products Co., Van Dyke, Mich.; vice president, J. C. Cox, S-M-S Corp., Detroit; advisory secretary, Thomas A. Fernley Jr.; and secretary-treasurer, Marie H. Lawton.

NEW PLANTS

Westinghouse Electric Corp., Pittsburgh, will build a multimillion dollar power transformer plant in Muncie, Ind. The project is being undertaken to meet demands for large transformers—some will weigh as much as 600,000 lb or more. Headquarters of the Transformer Div. will remain at Sharon, Pa.

International Business Machines Corp., New York, formally dedicated its military products plant at Owego, N. Y. The plant is producing bombing navigational and other weapon and guidance systems.

Pennsalt Chemicals of Canada Ltd., a subsidiary of Pennsalt Chemicals Corp., Philadelphia, dedicated its plant at Oakville, Ont. W. B. Billingsley is vice president and resident manager of the Canadian subsidiary. The parent firm will move the sales department and research and development activities of the Corrosion Engineering Dept. to its Natrona, Pa., plant in September.

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PIONEER IN POWDER AND MOLTEN METALLURGY

Your assurance of results...

your guarantee of genuine Firthite in your blue-print tools

When you specify Firthite sintered carbide for your important blue-print tools, you count on top quality and money-saving performance. Now, Firth Sterling, in cooperation with leading toolmakers, offers a guarantee of quality unmatched in the industry.

This exclusive new service is designed to help you get maximum efficiency in your metal removal applications. It is typical of the progressive thinking that has characterized Firth Sterling during more than 68 years of metallurgical pioneering.

CERTIFICATION: To assure you that the exact grade of Firthite you specify goes into the cutting tools you buy, the bright, new label shown above will appear on the shank of each tool. It certifies a product engineered and quality controlled from ore to the finished tool—tools that cut faster, stay sharp longer and reduce downtime for regrinding. Firth Sterling and most leading toolmakers have agreed to apply this label *only* on tools using genuine Firthite.

* * * *

Insist on the Firthite label when you order blueprint tools—your certification of grade and quality. For further information on Firthite sintered carbide, or help with *any* metallurgical problem write: Firth Sterling, Inc., Dept. 81G, 3113 Forbes St., Pittsburgh 30, Pa. Warehouses and offices in principal cities.

"Your Future is Great in a Growing America"

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HIGH SPEED STEELS • TOOL & DIE STEELS • STAINLESS SPECIALTIES • HIGH TEMPERATURE ALLOYS
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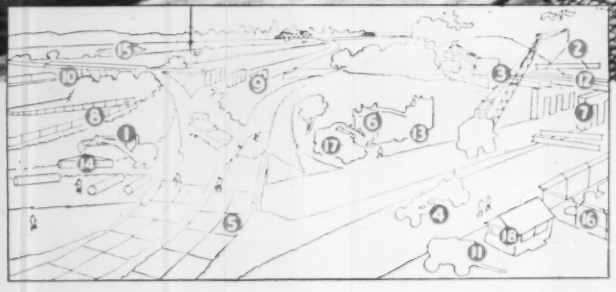
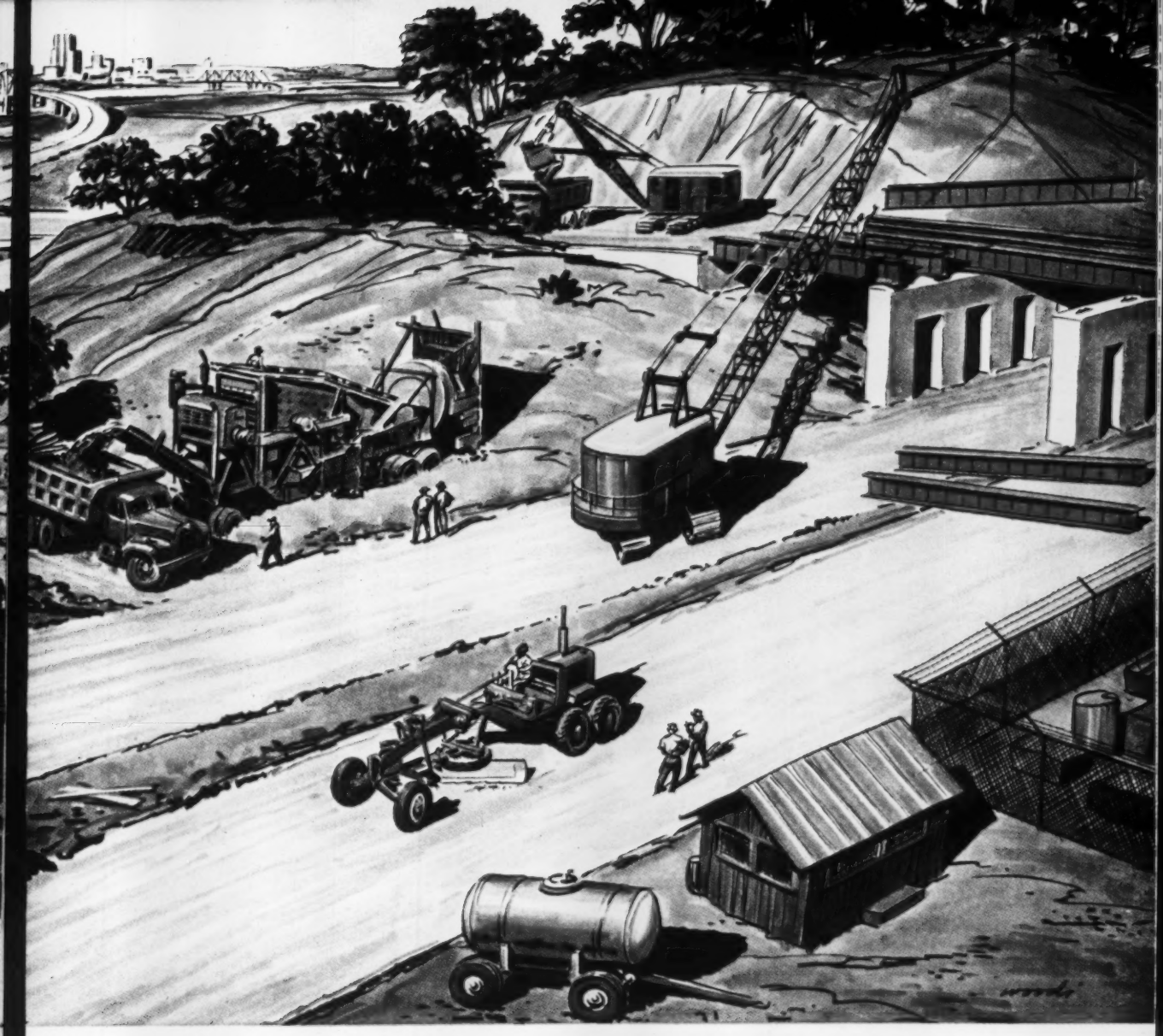
ZIRCONIUM • STERVAC & STERCON SUPER ALLOYS

FIRTH STERLING TRADE MARK



CF&I STEEL

1. Wickwire Rope
2. Wickwire Wire Rope Slings
3. Wickwire Boom Pendants
4. CF&I Cutting Edges
5. Clinton Welded Wire Fabric
6. CF&I Industrial Screens
7. CF&I Reinforcing Bars (in concrete)
8. CF&I Woven Wire Fence & Fence Posts
9. Cal-Tie Wire
10. CF&I Rails, Spikes, Track Bolts and Tie Plates
11. Claymont Heads
12. Claymont Welded Steel Plate Sections
13. Claymont Fabricated Steel Parts
14. Claymont Large Diameter Pipe
15. Claymont Alloy Steel Plates
16. Realock Chain Link Fence
17. Wickwire Springs
18. Gold Strand Insect Wire Screening



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Superhighways don't just happen. They are the result of careful planning by skilled engineers and builders . . . as well as the ability of manufacturers to have equipment and materials on the job site whenever and wherever they are needed. Today, America's accelerated roadbuilding program is making the task of these engineers, builders and manufacturers more challenging than ever before.

As a leading manufacturer of steel products for highways and other types of construction, CF&I pledges its wholehearted cooperation during the years ahead.

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NILSON 4-SLIDES FORMING PRODUCTION PROFITS... *Automatically*

COMBINE OPERATIONS on a NILSON

Wire and ribbon metal forms involving secondary operations can be produced at minimum cost on Nilson 4-Slides. You can combine stamping, welding, metal cutting and sub-assembly operations with the basic forming cycle . . . eliminate the need for expensive, single-purpose equipment.

The Nilson "Vertiform" shown above, for example, has a die head mounted on the right-hand forming slide. Wire stock is straightened, cut off, formed and threaded—all automatically in one cycle!

In addition to the new "Vertiform," Nilson builds 17 models of horizontal 4-slides, including 5 ribbon metal machines with built-in press units. For a new approach to low-cost production of wire forms and small metal stampings, it will pay you to get in touch with Nilson.

Send today for the Nilson General Catalog on Automatic 4-Slide Equipment!

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THE A. H. NILSON MACHINE CO.
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AUTOMATIC WIRE & RIBBON METAL FORMING 4-SLIDE MACHINES • WIRE & STOCK REELS • WIRE STRAIGHTENING EQUIPMENT • AUTOMATIC STAPLE FORMING MACHINES • SPECIAL WIRE FORMING EQUIPMENT

Coming Aug. 18

Charting The Market

Overproduction can be expensive, even ruinous. With capacity exceeding demand in many metalworking areas, it becomes more important to know what the market is and to gear production to known needs.

As we move toward a more scientific concept of marketing, we will have to sharpen our market analysis, our sales forecasting, our geographic analysis, and watch our product mix closer. STEEL's next Program for Management article will help you do those jobs.

Published so far in the 1958 series:

1. **Balancing Management for Profit (Feb. 17, p. 113)**
2. **Production Control for Profits (Mar. 17, p. 83)**
3. **Managing Defensework for Profit (Apr. 14, p. 125)**
4. **Building a Labor Contract (May 19, p. 125)**
5. **Pricing for Profit (June 16, p. 87)**
6. **Finding Out What Customers Will Buy (July 14, p. 101)**

Extra personal copies of these Program for Management articles are available until the supply is exhausted. Write: Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Finding Out What Customers Will Buy

ABOVE the cash register in a small-town hardware store is a sign: "The Customer Is King."

He is. He can make you or break you. It all depends on whether he wants what you produce.

That's why it's imperative to find out what the customer will buy.

The concept of finding out what the customer wants sounds so elementary it's hard to realize that it has not been more widely practiced. Perhaps the reason for the neglect is expressed by James H. Jewell, vice president of marketing, Westinghouse Electric Corp., Pittsburgh: "For too long we have regarded the customer primarily in terms of our needs to influence him favorably toward our products. Our marketing concept requires that we recognize him as an important source of information on needs and desires—with this information serving as the basis of planning and controlling our entire business operation."

Many people contend that the art of moving goods to the consumer lags at least a decade behind our ability to produce goods.

What with the concurrent disappearance of the sellers' market and the completion of a big expansion in our industrial capacity, we are forced to turn from a philosophy of production to one of marketing.

Its doctrine: Marketing is more than selling. It must precede production, rather than follow it. It encompasses the functions concerned with finding out what is wanted, measuring the demand, planning the product, and moving it to the consumer.

Too many times companies have built a new product, then set out to see how they could sell it. Under the new concept, you find out exactly what prospective customers want, where and when they want

it, how many or how much they want, and how much they'll pay. Then you make it.

The editor of one of the nation's leading marketing magazines said: "There is abundant evidence that many businesses are still organized on the principle of 'we make it; you buy it.'"

How To Find Out

How do you find out what the customer wants? Ask him. The process of finding out can range from the simplest of procedures to the complex. You can do it yourself, or you can hire it done.

You have three ways to ask: 1. By mail. 2. By telephone. 3. By face-to-face interview.

If you use the mails for finding out, you'll use a questionnaire. If you use the telephone or the personal interview technique, you'll find it helpful to have a questionnaire before you as a guide.

A Case Study

The Heil Co., Milwaukee maker of truck equipment, set out to learn prospective customers' wants before building a product.

It wanted to know how much demand there'd be for plastic truck bodies and what features and qualities the prospective customer would want. Getting such large products into production requires large equipment and a considerable capital outlay. The company had to be sure there was a market, and to put in the right kind of equipment, it had to know precisely what the market wanted.

The Heil Co.'s manager of commercial research, K. C. Sanders, handled the job of finding out.

His department prepared and mailed 3000 two-page questionnaires. Half went to meat packers, half to dairies.

Only objective questions—those asking for a "Yes" or "No"—or quantitative figures were used. Wordy and subjective questions which might be difficult and time consuming to answer were avoided. One question asked the respondent whether the doors of his truck were hinged or sliding, and which type he preferred. Meat packers were asked whether they hung meat from the truck ceiling and whether any special reinforcement was used.

The return was 15 per cent. The only spur used was a follow-up letter to those who had not responded within two weeks.

Before questions were used, they were pretested on transportation experts outside the Heil Co. This gave assurance that recipients would not be wasting their time and that their intelligence would not be insulted.

Room for Improvement

Mr. Sanders had an experience common to many researchers. He says he would make a few changes if he were doing the job again. He thinks a little more pretesting of

Why We Must Find Out What the Customer Will Buy

1. **The challenge is to market. Production is no longer a problem. Industrial capacity is overexpanded.**
2. **You have a better chance to sell when you make what the customer will buy. Too many manufacturers bring out a product before seeing whether it will sell.**
3. **It's more important than ever before to keep your plant busy. Heavy investment in plant and equipment makes idleness costly. Once upon a time, you could cut costs by laying off men. You can't lay off today's automated machines.**

What We Must Find Out

1. **Who would be a customer.**
2. **What he would buy.**
3. **How much he would pay.**
4. **How much or how many he'll buy.**
5. **When he'll buy.**

Finding Out Pays Off

1. Sales Are Boosted:

a. **By offering products that will be in big demand.**

b. **By uncovering new markets.**

c. **By helping you get into a market before it is saturated.**

2. Costs Are Cut:

a. **By making volume production possible.**

b. **By reducing the risk of new product failure.**

questions would have been beneficial.

"After a survey is finished and interpreted, every researcher has experienced the feeling that he could now construct a better questionnaire if only he had a second chance," says the noted market researcher, Alfred Politz, president of Alfred Politz Research Inc., New York. "This," he explains, "does not necessarily mean that mistakes were made the first time; but every question is based on assumptions, and after the survey is finished, some of the assumptions are proved, while others appear to be unsupported. With the knowledge gained, one could always design a more efficient questionnaire," Mr. Politz declares.

Ask the People

Another company that went to the people to find out what they wanted is Market Forge Co., Everett, Mass.

Samuel B. Sheldon, vice president of sales and operations, was dissatisfied with the back rest in his automobile. He put his company's research and engineering department to work devising an adjustable model that would be more comfortable and one that would contribute to a proper and healthful posture.

When his researchers and developers believed they had a prototype that would fill the bill, Mr. Sheldon sent it to leaders in the medical profession and to many of his prospective customers for their opinions.

They liked the seat. It was put into production. Customer response was immediate. As a result, the plant had to go on three shifts in March. On Apr. 1, it moved production up to 10,000 seats a month—and this was during the depth of the nationwide recession.

A Guard Against Failure

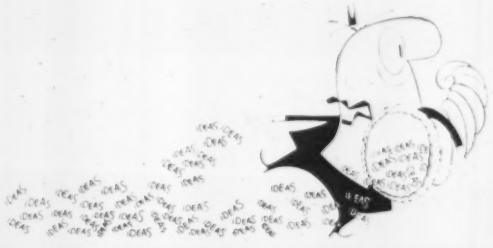
A market test doesn't always show there's demand for a product. Sometimes, it shows the reverse, an equally important piece of information.

General Electric Co. received many requests from the trade for a new type night light—one with a low light output, low wattage, long life, and a prong-base which could be plugged into a convenient outlet. One of GE's competitors had introduced such a light.

To find out what prospective customers wanted, GE wrote to 6000 people and asked whether they burned a light at night. To GE's surprise, about 16 per cent did. A sizable portion used ordinary lamps.

GE included a page that showed all of the common types of night lights in use and asked respondents to check the kind they used.

GE sent about 1000 of the pro-



Who Will Find Out What the Customer Will Buy?

I. Your Own Company:

1. By using its full-time market research department.
2. By using other members of its staff.

II. Outside Organizations, Including:

1. Market research agencies.
   a. Complete-service type (they can do the whole job).
   b. Limited-service type (they may do only tabulating or interviewing).
   c. Specialized-service type (they specialize in certain phases and may offer a standardized service).
2. Market research consultant (he is a specialist).
3. Management consulting firm.
4. Advertising agency (when it does such work, it's usually for advertisers it serves).
5. Advertising media (their services are usually available only to advertisers or potential advertisers).
6. Government agencies.
7. Educational institutions (some colleges and universities do market research).

Why 'Outsiders' Are Used To Find Out

1. To get a fresh and objective approach.
2. To supplement your staff with specialized talents and services.
3. To carry you over a peak in customer research.
4. To help you speed up a project.
5. To do the entire job when you don't have a customer research staff.

posed lights to those who used them, with a request that they try them out and give their reactions.

GE found that the users were firmly wedded to the type now on the market. They liked the shield, the switch, and the replaceable bulb —none of which were features of the proposed product.

Also, the price which the people thought was reasonable was lower than what GE could sell it for.

GE did not introduce the new product, and within a year the competitor who had brought out a similar product withdrew it from the market.

Finding out what the customer wants is a way of protecting your company from the failure of new products. New products are the life blood of any successful business, but the road is rough. Studies show that four out of five launched by 200 major manufacturers since World War II have flopped.

One company that seeks to guard against product failure through customer research is International Business Machines Corp., whose world headquarters are in New York. In an extreme case, IBM will spend the equivalent of 20 man-years to study a bold new concept and its possibilities of application.

A good example of an IBM product designed and engineered with the user in mind is the IBM 305 RAMAC. (Pronounced RAM-ACK, it stands for random access method of accounting and control.) The new electronic data processing machine makes it possible for records stored in the machine to reflect the business picture as it is at any moment.

The 305 RAMAC sells for $189,950 or rents for $3200 a month. Around 70 RAMACs have been installed, and 1200 are on order.

What Do You Want?

Whether you make a survey by mail, telephone, or face-to-face interview depends on whether you want quantitative or qualitative research, or both.

Quantitative research develops information of a numerical type, such as how many and what proportion. A questionnaire which deals with limited subject matter is often used.

When you want to dig deeper and find out why, what kind, or how, you use qualitative research.

In quantitative research, you usually deal with a large number of people. In contrast, qualitative research usually deals with fewer, but you spend more time with them.

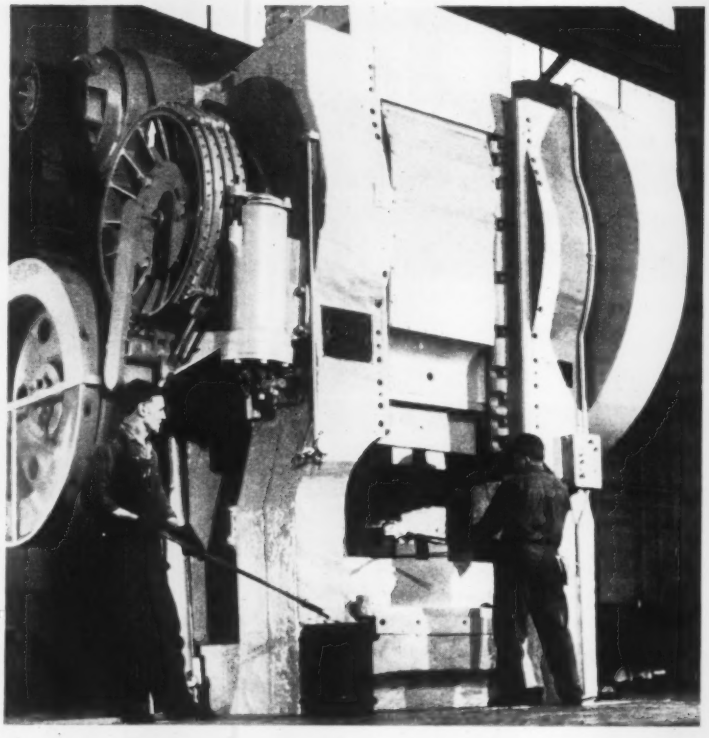
General Motors Corp., Detroit, uses both quantitative and qualitative research. For quantitative research, it depends on mailed questionnaires. GM's researchers recognize that certain types of information can best be obtained by personal interview. It makes considerable use of this method at auto shows to get public reaction to new models before they are put on the market.

GM Motoramas are an excellent means of obtaining public reaction to new models especially "dream cars." In some cases, they are not intended as "cars of the future." But they often have certain features —such as a fender treatment or a windshield design—which are so well received that they are translated into designs for production models.

By talking to thousands of people at these shows and asking them the right questions, it is possible to learn rather quickly which items are worth pursuing and which should be discarded.

GM sends questionnaires to car owners throughout the country, and the results are usually broken down

What Did the Customers Want?



Potential users helped design this forging press for the maker, Erie Foundry Co., Erie, Pa. The working area was moved forward 8 in. to make it easier to manipulate pieces in and out of the die

They Had a Chance To Say

SOMETIMES you can find out what the customer wants merely by asking him.

The technique was used by Erie Foundry Co., Erie, Pa., when it considered adding forging presses to its line. Forging hammers had been the firm's primary product, but management saw a growth trend toward press forging and wanted to add a line of mechanical presses.

To Robert E. Sanford, Erie's design engineer, fell the job of finding out. From experience in servicing, designing, and selling this type machinery, he knew there were fewer than 25 major users of forging presses. He was acquainted with many of the people he would have to see.

When time permitted, Mr. Sanford made trips to plants in eight cities. Over nine months, he talked to plant managers, superintendents, master mechanics, and maintenance men to find out what they wanted in a forging press.

He would say: "We want to design a new machine. Tell me your troubles and what you'd like to have."

Thoughts and suggestions "just rolled out," Mr. Sanford recalls.

"I don't say this survey was as complete as we would have liked to make it. We wanted to call on more of the smaller users. But after a while you do have to get something done," Mr. Sanford commented.

The people Mr. Sanford contacted were familiar with forging presses. They knew what they liked and disliked. They wanted ease of operation and maintenance. Users said presses would be easier to operate if they had more working area. Mr. Sanford was able to comply by spreading the front columns and moving the working area forward. The result: 8 in. more clearance to manipulate work in and out of the die.

From Mr. Sanford's findings, engineers drew up a design and supplied him with blueprints. With these prints, he paid two to three return calls to each person to check out the design. "We asked: Does this look like what you want?" The calls brought some suggested changes.

Out of the surveys came the 2500-ton mechanical forging press introduced recently by Erie Foundry. It is one of a line of presses ranging from 1000 to 6000 tons in capacity and selling for $80,000 to $550,000.

The time required (from the start of the surveys to completion of the press) was 18 months.

The cost of finding out was about $30,000.

Would Mr. Sanford do it this way again?

The answer is a positive "Yes."

by areas because varying conditions can cause differing viewpoints.

Three Ways To Ask

The mail survey is probably the most widely used method of asking a customer what he wants. It has these advantages: 1. It's economical. The cost per person contacted is far less than that of the telephone or personal interview method. 2. A wide geographic area can be reached—and you do it quickly. 3. There is no interviewer to influence the interviewee and produce a bias in the reporting. 4. The questionnaire gets beyond the interviewee's door. 5. Hard-to-reach people, such as those who are away much of the time, can be contacted. 6. Respondents can take enough time to answer carefully.

The telephone survey provides some of the personal contact of the face-to-face interview and does it faster. The method includes these advantages: 1. Travel is eliminated. 2. You can probe for answers.

The face-to-face interview yields more information than a mail or telephone survey, and the interviewer can do more probing to arrive at attitudes, desires, opinions, or facts. The interviewer can show samples or examples to help elicit reactions.

All three methods have their disadvantages. You can ask only a limited number of questions in a mailed questionnaire. You run the risk of "hang-ups" in a telephone survey. Face-to-face interviews take time, cost money.

Choose the method or methods that you think will have the most advantages and the fewest disadvantages in each survey you make. What may be considered a heavy disadvantage in one case may be less so in another.

Handle with Care

Choice of words in a questionnaire is important. A. Marsden "Tommy" Thompson, director of GM's customer research section, distribution staff, points to an early survey question asking whether customers wanted a car with radical or modified streamlining. "At that time 'radical' was an unpopular word and it would have distorted our replies," he explained.

If you do your own job of finding out, you ought to make sure that every one of your surveys is conducted across a representative sample. Otherwise, you will get a distorted picture.

Sometimes, this question arises: How many answers are needed to be sure that they are representative? A number of considerations are involved, including subject matter, type of questions, and breakdowns required. A note of caution: The

ROBERT E. SANFORD
Design engineer, Erie Foundry Co.

. . . he found out what customers want

Alfred Politz

There's a Limit to What They Know

The consumer thinks only in terms of what he is acquainted with, says the noted market researcher, Alfred Politz, president of Alfred Politz Research Inc., New York, whose list of clients reads like a bluebook of American industry.

If, in the 1800s, you would have asked a person what improvements he wanted in lighting, he might have suggested a bigger wick or a light that didn't smoke. He would have thought in terms of a kerosine lamp, for that's all he was acquainted with," Mr. Politz explains. He couldn't have been expected to say the improvement he wanted was electric lights. He had never heard of them."

New things must come from inventors and industry, Mr. Politz implies. At best, the consumer can tell you what he would like to achieve, or how you can improve a product.

Even when a person has heard of something new, he may not have built up wants for it. Wants have to be stimulated, Mr. Politz says. He illustrates the point this way: Suppose you took cigarets into a country where the people had never heard of them. They would not know whether they wanted them. Their wants would have to be built up.

total may be adequate for a nation-wide picture but inadequate if attempts are made to break the results down by areas or size of community.

Where To Get Help

If you aren't set up to do your own job of finding out, there are many outside sources of help. They range all the way from the one-man consultant to the large research agencies. They can do any portion of a job, or an entire project. They can be engaged for a one-shot job, or put on retainer. (For a guide, see exhibit on Page 103.)

There are advantages and disadvantages of doing customer research with your own people. The same holds true of outsiders. Your own people know your company and its field; an outsider has to become acquainted with them. But closeness to your problems may hinder your own people. An outsider can come in with a fresh and objective approach.

Finding out what the industrial customer wants is often more difficult than finding out what the users of consumer products want. Those who buy consumer goods usually don't have to take anyone else into consideration, but the industrial customer may. What the machine operator wants, for instance, may conflict with what the maintenance chief wants.

Also, it's impractical to take big machines to prospective industrial customers to check their reactions. The alternative is to use models or blueprints. Blueprints were used by Robert E. Sanford, design engineer of Erie Foundry Co., Erie, Pa., in finding out what improvements were wanted in forging presses (see Page 105).

Market research for specialized industrial equipment requires an expert with intimate knowledge of the proposed product—in the case of Erie Foundry, Mr. Sanford had those qualifications. It's usually easier to teach an engineer or designer the fundamentals of customer

Bernard Rafkin, Sylvania market researcher, gets public reaction to TV sets

research than it is to train the market researcher for such a role.

Customer research often requires more data than the research department's staff can collect. Because salesmen are out in the field, there's an inclination to saddle them with the job of data collecting and interviewing. The value of the sales force in gathering data has long been a subject of controversy. A frequently heard objection is that most salesmen are not qualified to do market research. It has been pointed out that their qualities differ sharply from those of researchers. Also, a salesman is inclined to feel that the extra duty takes too much time from selling and cuts his commissions.

W. C. Graham, a principal of McKinsey & Co. Inc., New York, a management consultant firm, points out that salesmen find it more difficult to get in to see people than market researchers.

Don't Expect Too Much

There's a limit to what you can get from customer research. You generally can't expect them to tell you what new products you should make. They don't know. They can help you, though, in the redesign or further development of your products. The consumer thinks only in terms of what he is acquainted with, says Researcher Politz (see Page 106). GM's market researchers concur: "The average person cannot project his thinking beyond the things he can see and use. He can have positive opinions about the design and construction of equipment now available, but it would be hopeless to get completely accurate expressions of opinion on what might be desired several years in the future."

It is still the job of the stylist and technical people to do the forward looking and to conceive the big ideas, the GM researchers aver.

In GM's case, it considers the average car owner as an expert on the use of the product, and it is in that area that the company seeks his opinions.

Wants vs. Needs

In polling the customers or prospects, we are trying to find out what they want. Wants should be distinguished from needs. You may not need a new automobile, but if you want one, a potential sale is created for the auto manufacturer. Sales are made by satisfying wants, not needs.

Continuity Pays Off

Customer research should be a continuing project, the experts say. At least, it ought to be done often enough to catch any significant changes in trends. A rule of thumb for the frequency of checking follows this order: 1. Consumer products. 2. Large products like stoves and refrigerators. 3. Large industrial products.

Some of the Politz clients use four studies a year; supplementary surveys are made when a situation requires it.

Louis Cheskin, director, Color Research Institute, Chicago, says that a number of consumer attitude studies it made "show clearly that consumer attitudes toward many products are not as they were a year ago, two years ago, or even three, four, or five years ago.

"For example, as recently as last year, our tests showed that people reacted favorably to elaborate ornamentation, gaudy color combinations, and extensive chrome trim on cars and other steel products, although the favorable attitudes were not generally admitted in direct interviews.

"Recent studies show that people are reacting unfavorably to such ostentatious ornamentation. They reveal that people who only a year ago were attracted by frills now react unfavorably to functionless objects."

One reason for the continuing ap-

Show a Sample: It Helps People Tell You What They Want

ONE WAY to find out what the customer wants is to show him the proposed product and get his reactions.

Sylvania Electric Products Inc., New York, used the technique to check the acceptance of its Sylouette, a 21-in. television console with a cabinet depth of only 10 in.

Sylvania conducted its test late in the summer of 1957 at a popular tourist center. The Sylouette was displayed between two 21-in. consoles of conventional design. One was a 1958 Sylvania console and the other was a comparable 1958 console from a competing line. (Product and company identities were concealed.)

"Visitors were asked to choose the set they liked best and to explain their choice," says Charles J. Hubbard, product planning manager of Sylvania Home Electronics, a division of Sylvania Electric Products Inc. "Nearly 3000 tourists participated in the survey over a two-week period. They answered questionnaires and were interviewed by representatives of Sylvania's Market Research Dept.

"Seven out of every ten persons who visited the display liked the Sylouette best, and more than half said they were attracted by its slimmer cabinet and unique design," Mr. Hubbard reports. Virtually no adverse comments on the design were made.

The set was placed in production "substantially as it appeared in the tourist center display."

Sales outstripped original production plans, and they had to be revised upward six times, Mr. Hubbard reveals. Sylvania has expanded on the design and put five different models into its 1959 line.

Sylvania also "went to the people" with its proposed 1959 radios. It made its survey at New York's Grand Central Terminal. The people suggested some changes. Sylvania is making them.

How To Get the Most Out of a Questionnaire

Imagine Yourself As the Recipient

He isn't nearly as excited about the questionnaire as you are. You must win a favorable reaction from him. Ask yourself: "How would I react to this? Would I be inclined to answer it?"

Keep It Short

A long one reduces the quality of answers and the quantity of return.

Make It Easy To Understand

Avoid wordiness. Use words people understand. Make questions simple. Ask only one thing per question. Phrase your questions so they will not be misinterpreted. Remember: It is not enough that a thing can be understood—it must be so clear that it simply cannot be misunderstood. Sometimes, an illustration will help express what you have in mind.

Make It Easy for Respondent To Answer

The less writing he'll have to do, the more returns you'll get. If a check mark won't serve, make it possible for him to answer with only a few words.

Make It Easy To Return

Provide the respondent with an addressed, postage-paid envelope or card for making the return.

Take Care in Organizing It

The sequence of questions often influences the quantity and quality of answers. Questions presented in a logical order are easy to answer. Any inflammatory questions should come last to prevent getting distorted answers to the other questions. If you must include hard-to-answer questions, place them last to avoid discouragement. Keep ease of tabulation and analysis in mind when you're formulating your questionnaire.

Don't Crowd It

A jam-packed page is repelling. Space the questions so they can be read easily. Leave enough room for answers, whether they are check marks or words.

Make Respondent Feel Important

To promote response, enclose a brief note explaining how much he is helping you. Chances are, you'll bolster his ego, get his co-operation.

Polish It . . . Pretest It on Your Associates

When you believe you have the questionnaire in tip-top shape, try it out on your associates. They often can spot bugs in it.

How To Speed Up and Enlarge the Response

Another way to boost the odds in your favor is to send a pencil, pen, or similar gimmick with your questionnaire, or offer to supply a copy of the results. (Sometimes, you can shake loose additional replies with a follow-up letter.)

Be Sure Your Mailing List Is Representative

If your questionnaire is going to only a portion of the people who are qualified to answer it, select a cross section. Otherwise, you may get a distorted picture.

Time the Mailing

For best response, mail questionnaires at the right time. One season may be better than another for your purposes. Summer vacations and year-end holidays can cut the returns.

proach is that attitudes never stand still. For example, several years ago most people would have answered "No" to this question: "Do you want an automatic transmission or power steering on an automobile?" In the early days of both developments, a frequent comment was: "I can do a lot of shifting for that amount of money," or "I wouldn't pay that much for some help in steering."

The devices were offered for those who wanted them. Through an evolutionary process, they came into such wide use that the manufacturer who doesn't offer them now will lose sales.

Researcher Politz points out that "some kind of change is involved in most marketing situations, and a second survey in the same area often reveals more than the first one because it indicates progress, or lack of it. But even beyond this is the fact that the logic of question-making favors a sequence of surveys.

"Research has little in common with the one-shot survey procedure, which so often is characterized by overexpectation and underproductiveness," Mr. Politz declares.

Time for Decision

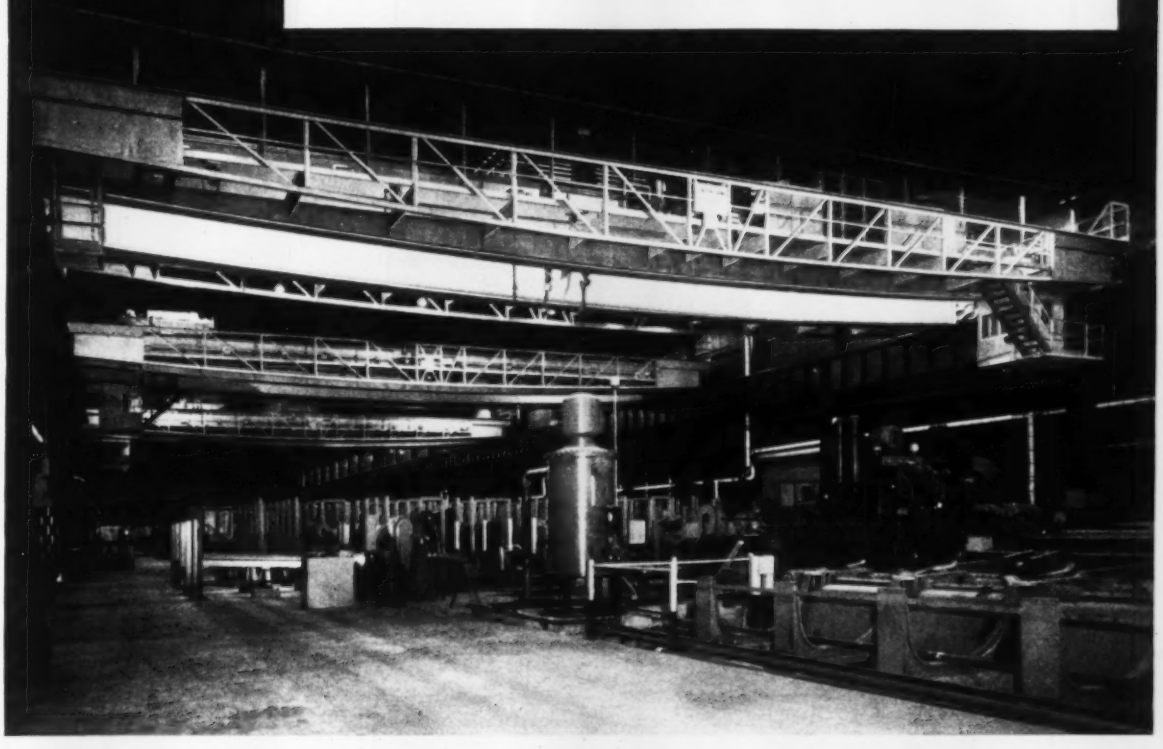
Completion of a survey brings the need for interpretation of results and for exercise of executive judgment. But judgment is no better than the information upon which it is based. That's why it's so important to find out what the customer will buy. The better the information, the better the executive judgment.

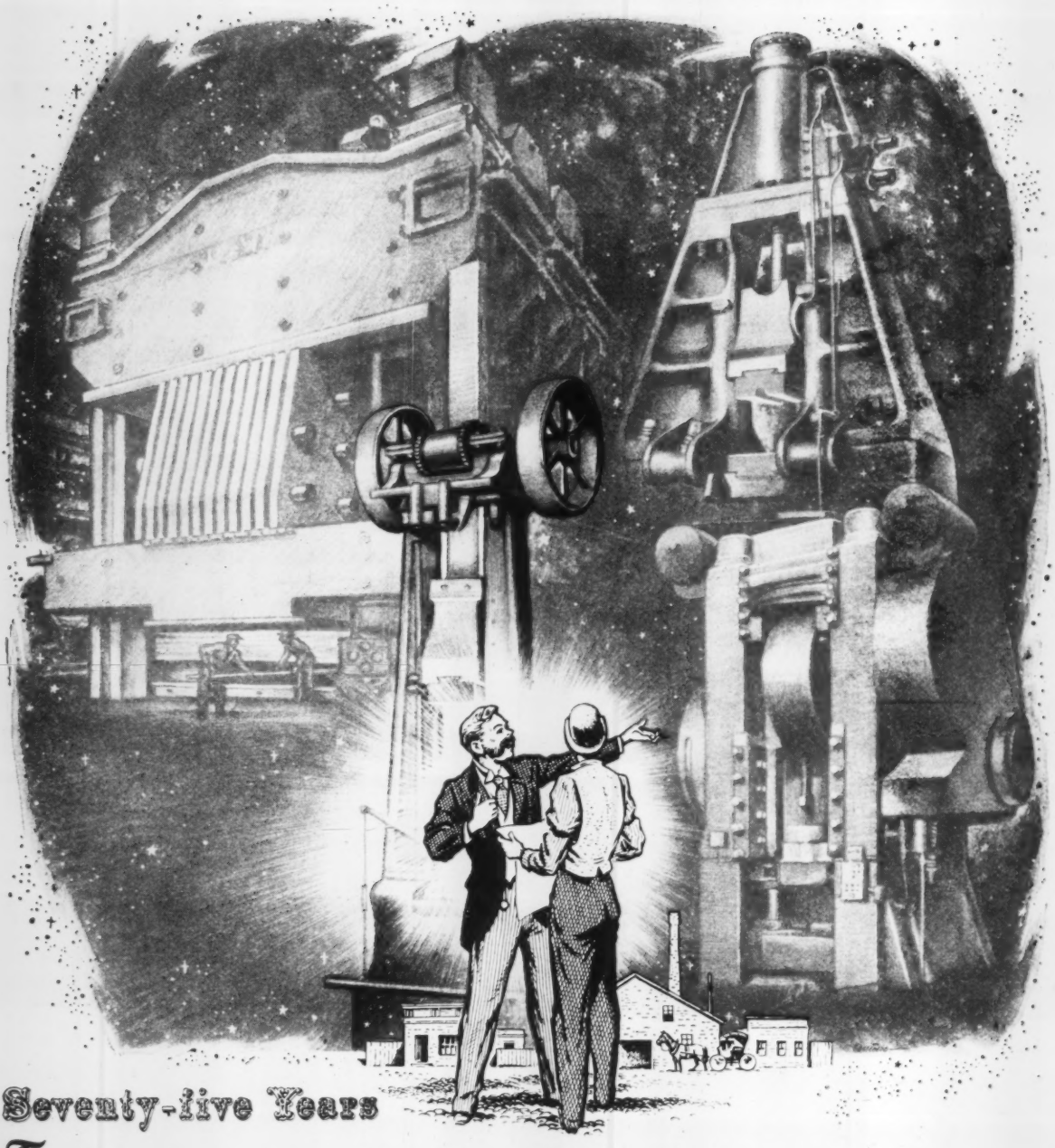
AMERICA'S LARGEST STEEL MILLS USE BROWNING CRANES

Built to A. I. S. E. Specifications or Your Own

For years, Victor R. Browning & Co. has devoted major time and study to the building of heavy duty mill cranes. The finest materials and workmanship go into the construction of these cranes. All shafts are of the highest quality alloy steel. All bearings are calculated with a proper life factor as required by the A. I. S. E. We will design to suit your special requirements or build to your specifications . . . Victor R. Browning & Co. also makes a complete line of trolleys which can be adapted to existing bridges.

VICTOR R. BROWNING & COMPANY, INC.
WILLOUGHBY (CLEVELAND), OHIO





Seventy-five Years

THERE WAS a growing surplus in the United States Treasury—the Polygamy Act was passed—letter postage was reduced from three cents to two cents—the Brooklyn Bridge was opened—standard time was adopted—in 1883, when two young men, just graduated from Worcester Polytechnic Institute, established the business bearing their names—WYMAN-GORDON. The total capital was $27,000.

Integrity, initiative, ambition and ability were theirs. Endowed with these qualities and privileged to operate under that unique American system of free, private, competitive enterprise the Company prospered and grew.

On this our 75th anniversary, we salute the spirit of our founders and we pledge our every effort to help preserve, against the steady erosion of the last quarter century, that system which has made our nation what it is today and which has enabled us to build the greatest industrial production in the world, resulting in the highest standards for all segments of our people.

WYMAN-GORDON COMPANY

ESTABLISHED 1883

FORGINGS OF ALUMINUM • MAGNESIUM • STEEL • TITANIUM

HARVEY, ILLINOIS **WORCESTER 1, MASSACHUSETTS** DETROIT, MICHIGAN

STEEL

July 14, 1958

Technical Outlook

PRESSURE BONDS—The new method joins aluminum and stainless, says Aluminum Co. of America. One of the first applications is an electric frying pan made of forged aluminum with a stainless lining. The process also makes other combinations like low strength bearing alloys on high strength aluminum castings or forgings.

CERAMIC IS SELF-BONDING— An interlocking lattice of pure material gives a new silicon carbide four times the strength of previously available grades. The ceramic will find many uses in mining and processing iron ore where wear is a big problem. It withstands temperatures up to 4000° F. The producer is Carborundum Co., Niagara Falls, N. Y.

MACHINING DETECTIVE—Broken tools in deep holes aren't the problem they used to be in automatic machining. Buhr Machine Tool Co., Ann Arbor, Mich., makes the tools part of an electrical circuit. When they break, the machine shuts itself off—it works somewhat like a fuse in an appliance, preventing damage to the workpart or other tooling.

TEST FOR ALUMINUM'S DURABILITY—A truck concrete mixer has been made entirely from aluminum. The experimental unit is being tested by the Construction Machinery Co., Waterloo, Iowa.

SHOT PEENING FORMS STEEL—Peenforming, the method by which some aircraft companies contour large, ribbed wing panels (see STEEL, July 7, p. 68), is being used on stainless steel at Aeronautical Service Engineering, Albertson, N. Y. It's the final operation in forming a Type 302 leading edge for a commercial airplane. Peening removes the residual tensile stresses created by springback from a press die and forms the final contour on the part. The company has also selectively peened certain areas on steel brake bands to form an eccentric part that gives better braking action.

STRETCHY PAPER—An eastern firm has a process which makes paper more resistant to tearing. Tensile strength is lower than that of conventional types, but the stretch is said to upgrade bags, wrappers, and packaging materials.

FLEXIBLE STAINLESS COUPLING— In some aircraft applications, coiled stainless tubing is cheaper, lighter, and more reliable than hose, say investigators at the Martin Co., Baltimore. You can get their design recommendations from OTS, Department of Commerce, Washington, D. C. (Ask for PB 131720.)

UNIT MIXES GAS—A new proportioner will find uses where: 1. Mixed gas is fed to a machine or pipeline. 2. Gas flow is intermittent and a purge cycle cannot be used. 3. A fixed proportion of gas is needed over wide ranges of total flow. It is made by Air Reduction Co. Inc., New York.

CERAMIC REPLACES METAL—A silicon-nitride bonded refractory developed by Carborundum Co., Niagara Falls, N. Y., is used in a pump handling molten aluminum. The high strength material is formed to close tolerances. Future uses suggested include burner tips and nozzles, valve parts, kiln furniture, and impeller arms.

Metalworking Outlook—Page 55 Market Outlook—Page 153

How We Beat the Cost Crisis

Automation Between Machines Nets Us $38,436 a Year

Tying a bore grinder to a radius grinder with automatic handling trimmed part cost 75 per cent for this manufacturer. It's another example of how aggressive management curbs inefficiency and crops unnecessary expenses through production improvements. This article is one of the top entries in the Cost Crisis Competition. Look for another next week.

LOOKING FOR places to cut unit production costs, members of the industrial engineering department at Eaton Mfg. Co.'s Axle Div., Cleveland, drew a bead on the finish grinding of differential side pinions for heavy duty truck axles.

The parts are machined, then hardened. Next, they go to a grinding department where the bores are finished and radiuses are ground. Although production rates and part quality were good, costs for the two grinds looked out of line.

The most critical influence on costs was direct labor—two operators to run the Heald bore grinders, and two more for the pair of Van Norman grinders used to generate the face radius.

The Decision—A first check suggested new production equipment for the job. Robert E. Wilbert, methods supervisor of the industrial engineering department, says the group found: "New machines ($68,000 worth) would not improve production or, with the exception of maintenance costs, save us any money."

The group decided to work with present equipment, adding whatever automation was necessary to cut the labor cost on the job and maintain production and quality standards.

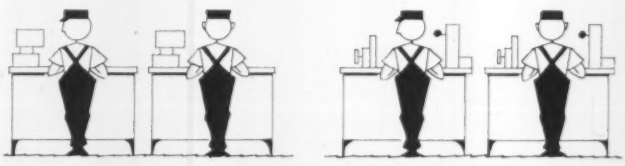
The Answer—Here's the idea the group came up with. Only one operator would be needed to run the four machines if the two bore grinders could be equipped with hopper feeding and automatic loading, and if the parts could be unloaded automatically, transferred to the radius grinders, and again loaded and unloaded automatically.

The idea was turned over to Eaton's Central Research Div. for final design and fabrication.

How It Works—The grinders are tied together, one bore grinder and one radius grinder per set. One operator loads machined and hardened pieces into the two hoppers on the bore grinders. His is the only direct labor charge of the four machines.

Parts are automatically oriented in the hoppers. Feed fingers pick them up and load them into the chucks. After bore grinding, a

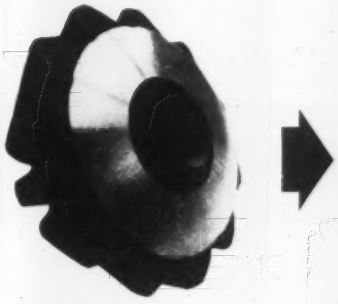
OLD METHOD

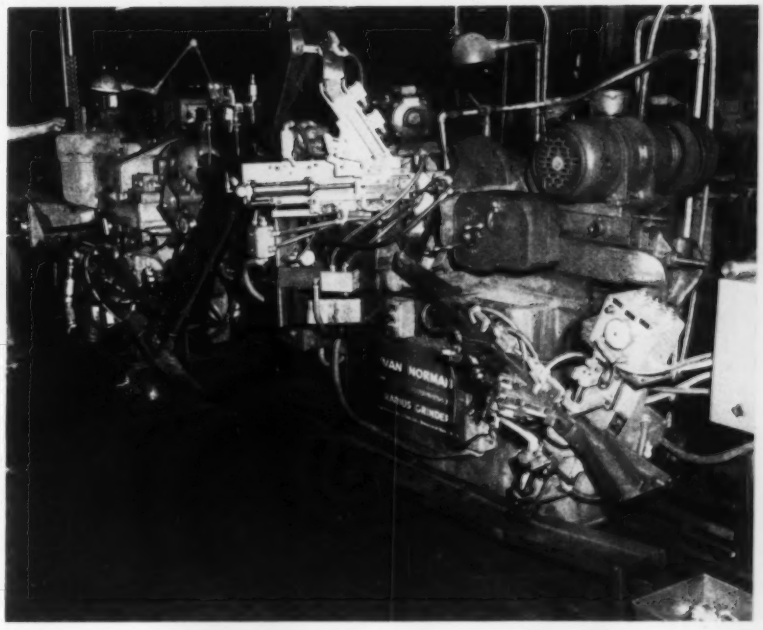


Two internal grinders Two radius grinders

FOUR OPERATORS

Cost per part $0.085





These pinions automatically move from the hopper of the first machine to the discharge chute of the second machine.

Saved per part: $0.064

pusher ejects the parts from the spindle into a gaging station. After gaging, the parts drop into a chute, are oriented again and lifted on an inclined elevator into the hopper of the radius grinders.

Orienting, handling, and gaging on the radius grinders are done as they are on the bore grinders.

The Payoff—It cost $35,480 to build the new equipment, install it on the machines, and add the necessary gaging.

Unit costs for the parts have been pared from $0.085 to $0.021.

At the forecast production level, unit savings will turn in a first year saving of $38,436—more than enough to pay for the improvement.

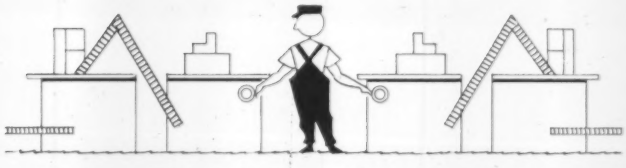
The rate of return comes within a whisker of the 108 per cent predicted in the proposal of production and methods men to top management for authorization and funds.

Quality, Too—Unit savings and over-all financial return to the company justified the investment. But there's at least one more gain.

Mr. Wilbert says tolerances (± 0.0005 in. on the bore) are being turned out more consistently than before. The human variable has been removed from the grinding operation—and each part is checked. When the machines were hand operated, the operators ran only spot-checks on workpieces to keep the size within the tight limits.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

NEW METHOD



Two internal grinders, automatically passing parts to . . .

Two radius grinders

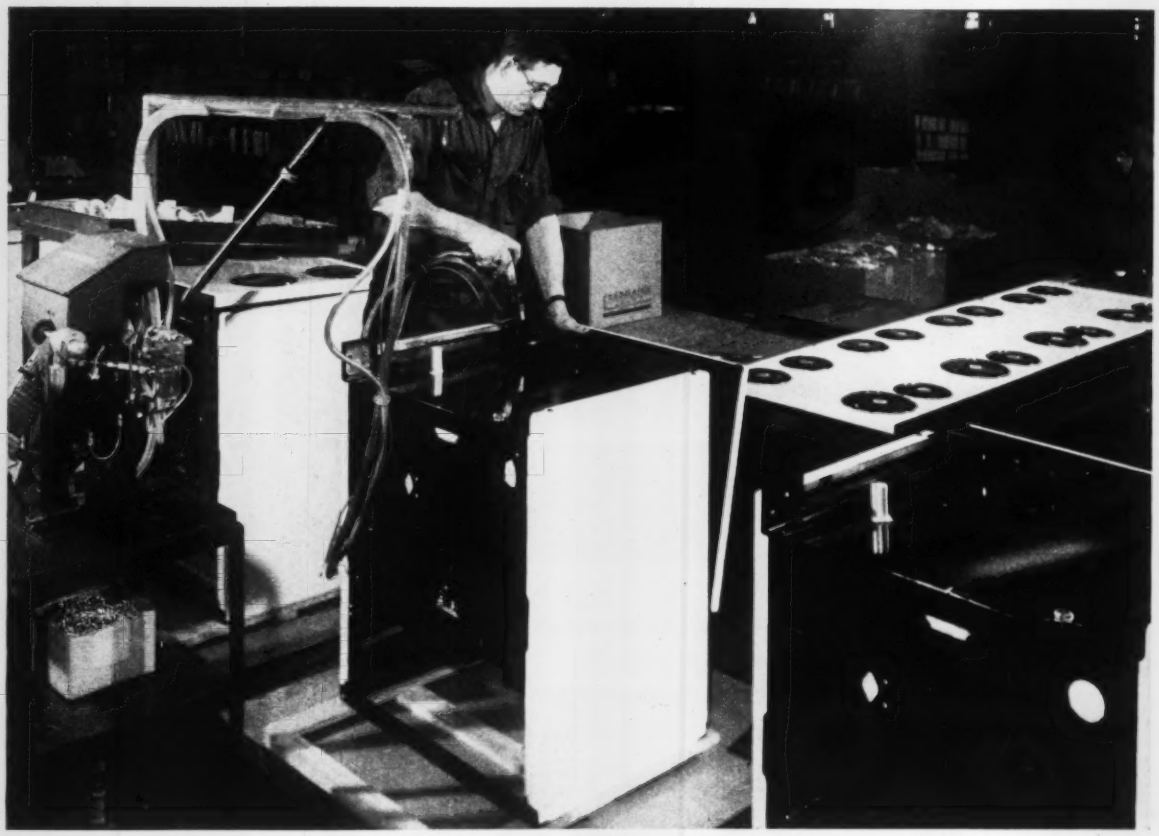
ONE OPERATOR

Cost per part $0.021

RETURN ON INVESTMENT

108%

the first year



Operator near the end of the line gets into tight corners with the automatic screw setter. Mounting (left) has 12-ft hose. Screws are in top hopper

Screw Setters Speed Appliance Assembly

Replacing manual positioning of screw fastenings with an automatic feeding device increases quality and production. Here's how the idea worked for an Ohio firm

AUTOMATIC screw setters cut about 8 minutes from stove assembly time, says Newark Stove Co., Newark, Ohio. The firm makes Sears, Roebuck & Co.'s Kenmore electric ranges.

Assembly Method — Each stove uses about 51 screws. Assemblers used to handle each one separately.

Each unit (they're called Jet-Setters by Parker-Kalon Div., General American Transportation Corp., Clifton, N. J.) delivers preassembled screws and self-locking washers from a hopper to a portable power screw driver. Operators along the line simply place the unit at the proper location and pull a trigger. Ranges are built up on a platform conveyor.

Costs — Newark Stove invested $15,000 in nine automatic screw feeders. Installation costs averaged about $100 a unit. Those along the assembly line are permanently mounted on a welded steel base which holds the hopper and screw feed unit. A pivoting pipe rack holds up a 12-ft plastic delivery hose. Operating range is 40 ft.

Buildup—To start the assembly, an operator drives two screws to fasten the service lead support to the stove back. (Driving is done downhand.) He puts the stove on an assembly skid, applies insulation to the back, and sets the oven on it.

The next Jet-setter drives four screws to fasten the oven to the range back. At a subassembly lo-

SCREW SETTERS . . .

cation, the enameled end panels are tapped for leg-leveling screws while the operator installs five screws with preassembled washers.

End panel assemblies are put on with six screws through the oven bottom support, oven front and back, right and left end panels. The two slides follow—one screw through the front of each slide into the end panel.

Four screws hold hinged cams to the oven door liner.

The next operator places the oven door insulation, then slips the door panel over the liner, locking the top in place before he sets three screws. At this point, the range is placed on a light wood base.

A collet head Jet-setter is used to fasten oven top insulation because of limited clearance. Five screws hold its liner. The operator also installs the oven door top liner, the insulating blanket, and sets the range top, with its preset burners.

The final operations connect the main top to the rear gusset, two backguard support brackets, ground strap, and backguard brackets to the backguard.

Idea for Scrap Handling

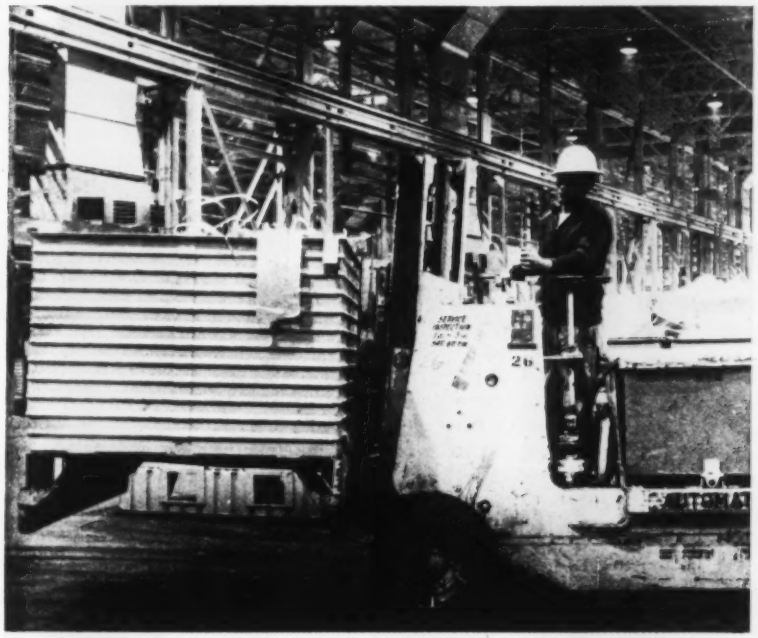
SCRAP STORAGE in large material handling boxes (8000 lb capacity) makes identification and separation easy at Kaiser Aluminum & Chemical Corp., Ravenswood, W. Va. The boxes double as storage bins and handling units.

They are used as receptacles where scrap is produced. From there lift trucks move them to an area where they are kept until baling.

Tags Show Contents—Each box is marked to tell what it contains. Tags show: alloy, date, and operator's badge number. Colored tags identify the department that generated the scrap.

Each container is 6 ft 5 in. long, 4½ ft wide, and 4 ft 1½ in. high. The lower skid has a 12½-in. underclearance, permitting the boxes to be automatically dumped at the baling pit. They are designed for four-way entry by fork trucks.

A box weighs 1162 lb. Berger Div. of Republic Steel, Canton, Ohio, designed and built the storage units.



Separate boxes for each type simplify collection, storage, and identification. They are designed for four-way entry by fork trucks. Each box holds up to 8000 lb

Holds Shock Waves

Stainless castings answer need for strong metal that resists intense heat and pressure

AN assembly of stainless castings holds shock waves that travel 17 times the speed of sound.

In operation at Lockheed's Missile Div., Palo Alto, Calif., the device aids scientists in their study of the tremendous pressures and temperatures generated by such waves, which can reach 2300 psi and 15,000° F for short periods.

SCIENTISTS
. . . probe 15,000° F shock waves

How Assembly Helps—Researchers use small models in their search for the laws behind high temperature gases. The tubelike assembly has a thin diaphragm at one end which ruptures when the pressure reaches a high point. Released gases speed down the tube behind a hypersonic shock wave.

Two compression techniques are used. One operates with high pressure helium. The other is a mixture of hydrogen and oxygen which is exploded with a spark.

A dump chamber about 18 in. in diameter at one end of the tube absorbs the shock wave.

Castings—The outside diameter of the Lockheed tube is between 5 and 6 in.; the inside is 3 in. It was spun cast in three sections by the Electric Steel Foundry Co., Portland, Oreg.

New Alloys Can Be Formed While Soft, Then Aged to

NEW TITANIUM ALLOYS	Alloying Elements	FORMABLE CONDITION 0.2% Yield (psi)	Ultimate (psi)	Elong. in 2 in. (%)	AGED CONDITION 0.2% Yield (psi)	Ultimate (psi)	Elong. in 2 in. (%)
B120VCA	13V, 11Cr, 3Al	120,000	125,000	10	170,000 to 220,000	190,000 to 240,000	6 to 2
C115AMoV	4Al, 3Mo, 1V	105,000	145,000	13	160,000	180,000	7
C105VA	16V, 2½Al	70,000	110,000	16	165,000	185,000	5

TITANIUM Gets Ready

Crucible Steel has developed three new heat-treatable titanium-base alloys. One of them, a beta phase alloy, can be aged to a yield strength of 220,000 psi

TITANIUM producers are stepping up efforts to spur demand. Their approach: Reduce prices and improve properties.

• In the last five years, the price of mill products has been dropped more than 50 per cent. Prices now are 20 to 40 per cent of what they were in 1941.

• Crucible Steel Co. of America, Pittsburgh, has three new alloys (see table at top of page). One, the beta B-120VCA, can be aged to a yield strength of 220,000 psi—two times stronger than the best sheet alloy available in 1953.

Seek New Applications—Development of more nonmilitary uses has been hampered by the time it takes to prove out designs; sometimes, years may elapse between initial design and the building of a production unit.

A few industries are beginning to take advantage of titanium's corrosion resistance. Applications are growing in food processing, chemical, petroleum, paper pulp, and marine equipment.

"But no one expects the nonaircraft uses to reach significant proportions for several years," cautions Dwight W. Kaufmann, manager of the Titanium & Vacuum Metals Div., Crucible Steel. "In the meantime, we must rely on the aircraft market to sustain the industry," he explains.

Higher Strengths Needed—Nonaircraft applications usually take advantage of the metal's corrosion resistance. The unalloyed alpha type with its hexagonal lattice arrangement of atoms has yield strengths of 40,000 to 70,000 psi which is adequate for most nonmilitary uses.

Structural parts for military planes are made from alloy grades which combine the alpha and beta, which has a cubic lattice. Alloy additions raise the strength of the metal to a useful level in its annealed condition.

But even higher strengths are required in the new missile designs. To keep titanium in the running with the new superalloys that are being developed, Crucible Steel has

High Strength Levels

APPLICATIONS

Sheet and structural shapes requiring high strength to 575° F and optimum formability; excellent strength-weight ratio for a few hours to 1000° F and shorter times to 1400° F.

Aircraft sheet uses requiring good formability and heat treated strength. In aged condition, alloy shows excellent creep resistance and good creep stability to about 800° F.

Similar to C115AMoV. Weldable. The welds can be solution heat treated and aged to base metal strength and ductilities.

for Space Age

introduced three new alloys it calls Formageable (formable plus ageable) that can be formed easily while in a solution treated condition, then thermally aged to high strength.

Highest Strength Alloy—Crucible says its B-120VCA is the most versatile titanium-base alloy that has been developed. The company claims it has the highest strength and best formability of any titanium base material; it is ductile-weldable; it can be cold headed; and it has deep hardenability. Those properties stem from its highly alloyed, beta structure, say Crucible metallurgists.

Some B-120VCA mill products (sheets and wire) are in pilot production. Thin sheets (less than 0.030 in.), strip, foil, bars, billets, and other products have been made so far in limited quantities.

The composition contains relatively large amounts of vanadium and chromium, both beta stabilizers. Aluminum balances the alloying elements so the structure stays all-beta during forming and/or during slow cooling. It also promotes aging to high strengths at short times and low temperatures.

Annealing B-120VCA sheets with normal air cooling also solution quenches them to a formable condition and simplifies mill processing and shop fabrication. In the formable condition, the alloy has a minimum yield strength of 120,000 psi. Aging 20 to 100 hours at 850 to 950° F brings it up to the 170,000-200,000 psi yield strength range with good residual ductility. Higher strengths are possible with a reduction in ductility.

B-120VCA is being tested for aircraft skins, stiffeners, and other structural shapes that require high strength for long times at temperatures to 575° F. It also seems suited for missile components that require a high strength-weight ratio for a few hours up to 1000° F and shorter times up to 1400° F.

Other New Alloys—But the new beta alloy is not a cure-all. It has the best strength and fabricability, but not the best long time, high temperature stability. Alpha alloys have the best all-round strength, stability, toughness, and weldability, but limited formability. The combined alpha-beta alloys offer the best compromise on strength, formability, and stability.

Crucible's other two Formageable alloys, C-115AMoV and C-105VA, fall into the alpha-beta class. They have about the same yield strength (160,000 to 165,000) in the aged condition. They vary in formability and creep strength.

C-115AMoV contains 4 per cent aluminum which improves elevated temperature characteristics with a modest sacrifice in room temperature formability in the solution-treated condition. The alloy has excellent creep resistance and good creep stability to about 800° F.

C-105VA contains 2.5 per cent aluminum and 16 per cent vanadium. Vanadium stabilizes enough of the beta phase for good heat treatment response and room temperature formability. This alloy has better bend ductility than C-115AMoV, but its resistance to creep falls off rapidly above 600° F.

Both alloys can be aged to a wide range of strength-ductility levels by varying solution treatment temperatures and aging temperatures and times.

C-115AMoV is available only as sheets. C-105VA is available in sheets, but plates, bars, billets, and wire are produced in limited quantities.

Crucible expects the new alloys to be used in some of the advanced manned aircraft, such as the F108 long-range interceptor and B70 chemically fueled bomber, and many of the long range missiles.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.*

Operators are tackwelding cast iron cones to the carbon steel tubes. Welds made with nickel alloy rods break cleanly and eliminate expensive repairs of holes in the gas scrubber

Nickel Joins Dissimilar Metals

Electrodes based on the metal lick some difficult joining problems. This firm found it solved troubles in tackwelding cast iron to mild steel in making gas scrubbers

NICKEL alloy electrodes are the answer to tackwelding carbon steel to cast iron, says Aerotec Corp., Greenwich, Conn.

Problem—The firm makes mechanical gas scrubbers. Inside each one is a bundle of seamless carbon steel tubes, each of which has a cast iron cone tacked to its lower end. Chipping hammers used for weld and splatter cleanup sometimes left fractures and cracks in the tackwelds. They often failed when the scrubbers got unusually rough handling during shipment.

Also, when cones had to be replaced, they wouldn't break off cleanly because of brittleness around the weld. (It was caused by too deep penetration into the cast iron.)

Change Produces Results—Steven Paulo, Aerotec assistant shop superintendent, says that he has "never seen a crack across a weld made with nickel alloy rods."

Aerotec welders prefer 5/32-in. rods. They are fast, neat, efficient, and give better control than the 1/8-in. size.

The firm uses a Lincoln Shield Arcwelding machine rated at 40 volts. (It is set for 175 amperes.)

Gas scrubbers extract solids and distillates from gas lines. They were developed from experience with mechanical devices for collecting fly ash and industrial dusts.

Magnetic Handling

Moving sheet metal is easier and faster with rolls that cling tightly to slippery surfaces

PERMANENT magnets in the form of rolls are gaining wider acceptance in feed mechanisms for handling sheet steel. One of the latest examples (made by Eriez Mfg. Co., Erie, Pa.) feeds 40-lb blanks to a notching press at Hotpoint Co., Chicago. They become the outer shells of refrigerators.

Replaces Pinch Types—A rotating, magnetic roll at the center of the feeder grabs the leading edge of the sheet and pushes it into the press, where six additional rolls carry it through.

Another set of magnetic rolls is at the discharge end of the press. They are above the sheet so the magnetic action can suspend the blanks, letting them drop clear. The systems have done away with the manual pulling out of sheets.

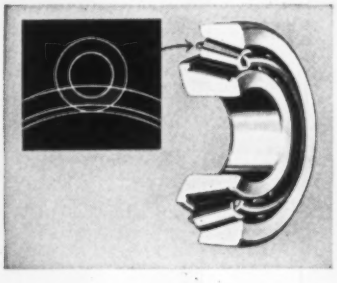
Rubber-covered magnetic rolls provide a positive feed of outer case blanks into a tangent bender. The covering prevents marring of these sheets which are formed into the bodies of the Hotpoint refrigerators.

PRESS FEEDER
. . . uses magnetic rollers

Magnetic rolls can be used for many material handling problems involving conveying, holding, controlling, and elevating. They can be easily put into present lines.

Other Uses—Permanent magnets are used also for feed rolls in a pipe mill. Pipe that is sawed to length is handled almost automatically by rolls which feed pipe from side to side on the saw tables.

Tomorrow's "dream" is our job today!



HIGHER FLANGE IMPROVES ROLLER ALIGNMENT

As shown by the gray area above, the higher flange provides a large two-zone contact area for the roller heads. This greatly reduces wear—practically eliminates "end play". Larger oil groove provides positive lubrication.

There's more to the car of tomorrow than just futuristic styling! Automotive engineers are working to perfect completely new power plants—like turbine engines—to achieve yet-unheard-of performance and economy! And they demand bearings that are as advanced as their thinking. This is no new challenge to Bower engineers. A glance at the design features listed at left will tell you a few of the many original Bower contributions to bearing performance which have reduced bearing maintenance and failure to a practical minimum. There are many more in the making. If your product is one which needs advanced bearings *today* plus realistic planning for the future, specify Bower. There's a complete line of tapered, straight and journal roller bearings for every field of transportation and industry.

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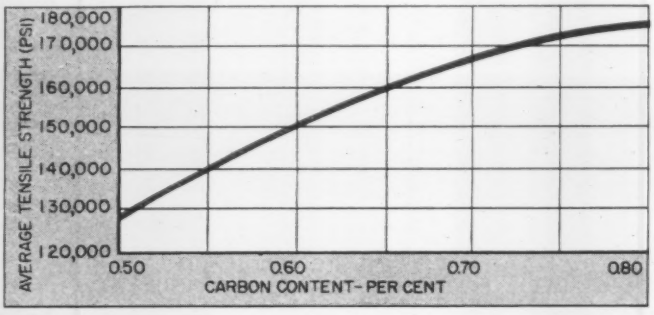


The average tensile strength increases with the carbon content

What Patenting Does for Hot-Rolled Rods

(0.70 Carbon)

	HOT ROLLED	PATENTED
Microstructure	Free ferrite, coarse pearlite, and fine pearlite	Ferrite and fine pearlite
Tensile strength	130,000 psi	165,000 psi
Maximum reduction	65%	90%
Final properties	Inconsistent	Uniform

Patenting Change Makes Wire Better

By R. H. HERTZOG
Metallurgical Engineer
John A. Roebling's Sons Corp.
Trenton, N. J.

New process results from study to determine methods of obtaining optimum microstructure. It requires less stockpiling, is more economical in other respects

TRIPLE BENEFITS stem from a revision in the lead patenting process used in the production of high carbon steel wire at John A. Roebling's Sons Corp., Trenton, N. J.: Costly stockpiling is reduced; the finished product has uniform properties; and production efficiency is improved.

In lead patenting, wire is first heated to austenitize it. Quenching in a lead bath produces a microstructure that has a high tensile strength and ductility for cold flow of the steel through the drawing dies. Varying the temperature of the quench controls the microstructure and tensile strength.

On the average, tensile strength increases with carbon content (see graph on this page).

Individual heats often vary from the values shown.

New Method—The Roebling firm found that a relatively small change in the quench temperature (75° F or less) could adjust the heat that deviated from the average value. The old method of patenting all rods to the same strength required changes of 150° F or more.

In the new method, steel is processed to a tensile strength determined by its nominal carbon content, regardless of rod or wire size or chemical elements other than carbon.

As a result, the gain in strength due to wire drawing is consistent for any one type of carbon steel; the patented microstructure is practically constant; and variations in properties of the finished product are small.

The quench temperature is not determined by the carbon content but by rod or wire size. Experience has shown that these ranges are good:

975-1050° F	over 0.25 in. in diameter
1000-1075° F	0.165-0.25 in. in diameter
1075-1140° F	0.041-0.164 in. in diameter

Small quench temperature adjustments are necessary from heat to heat.

Study—Before devising the new process, Roebling took a look at two basic methods of lead patenting:

1. Holding temperature of the lead bath constant. Resulting strengths depend on rod size and composition.
2. Varying temperature to obtain specific tensile strengths.

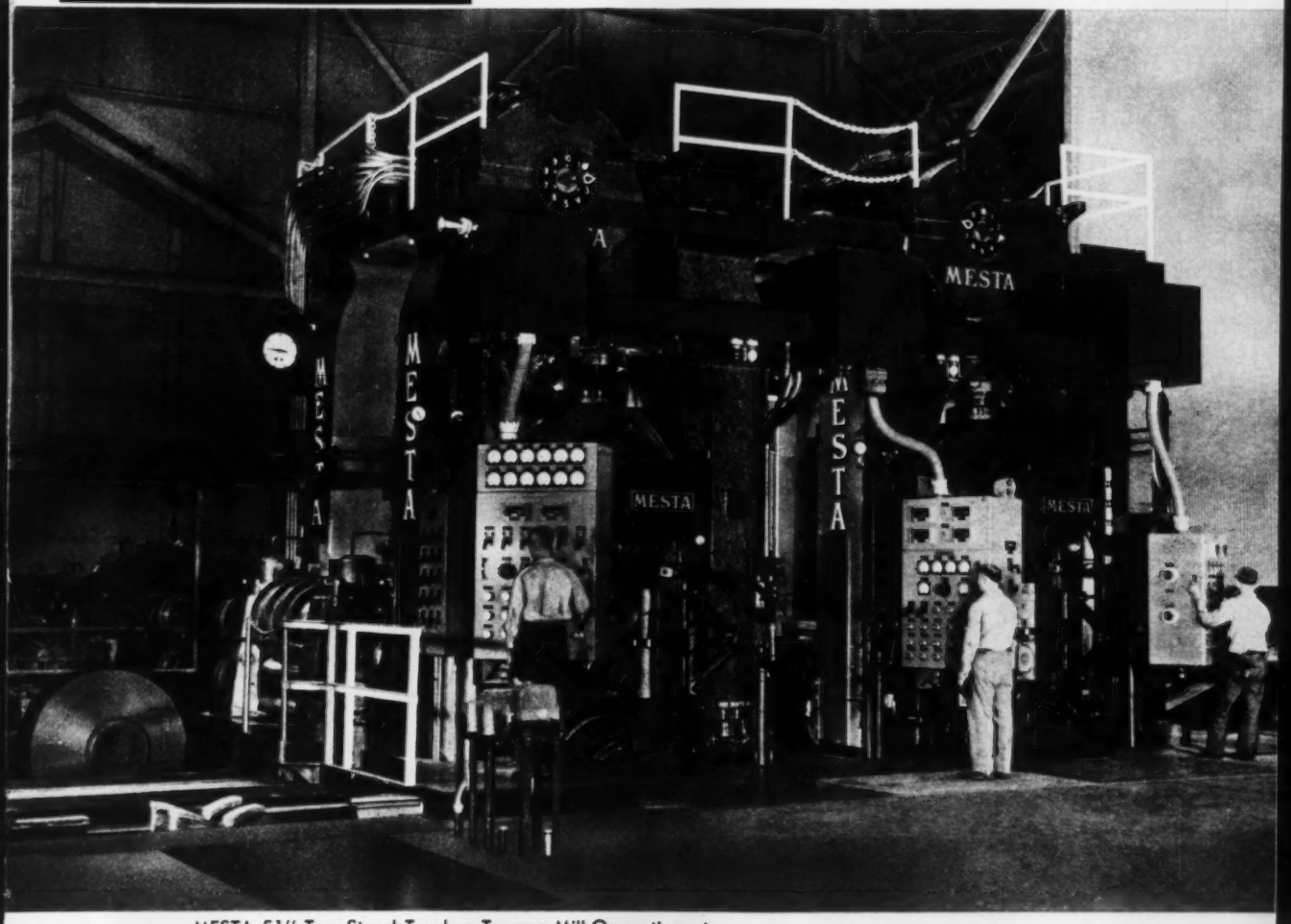
In the first method, it is necessary to stockpile to insure smooth production scheduling. That is costly and burdensome.

The chief disadvantage of the second method is the necessity for numerous changes in the quench temperature that are required within heats and from heat to heat. Also, the microstructure will vary.

To overcome the problems, the firm made a study to find the optimum microstructure and methods for obtaining it.

What It Found—Mechanical tests on $\frac{3}{16}$-in. diameter wire showed that elongation and reduction of area values reached a maximum in the region of 1025 to 1050° F quench.

MESTA COLD MILLS

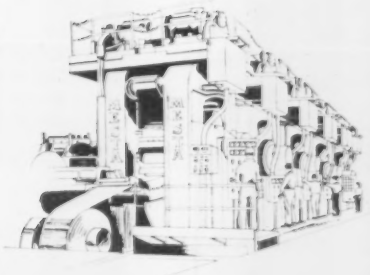


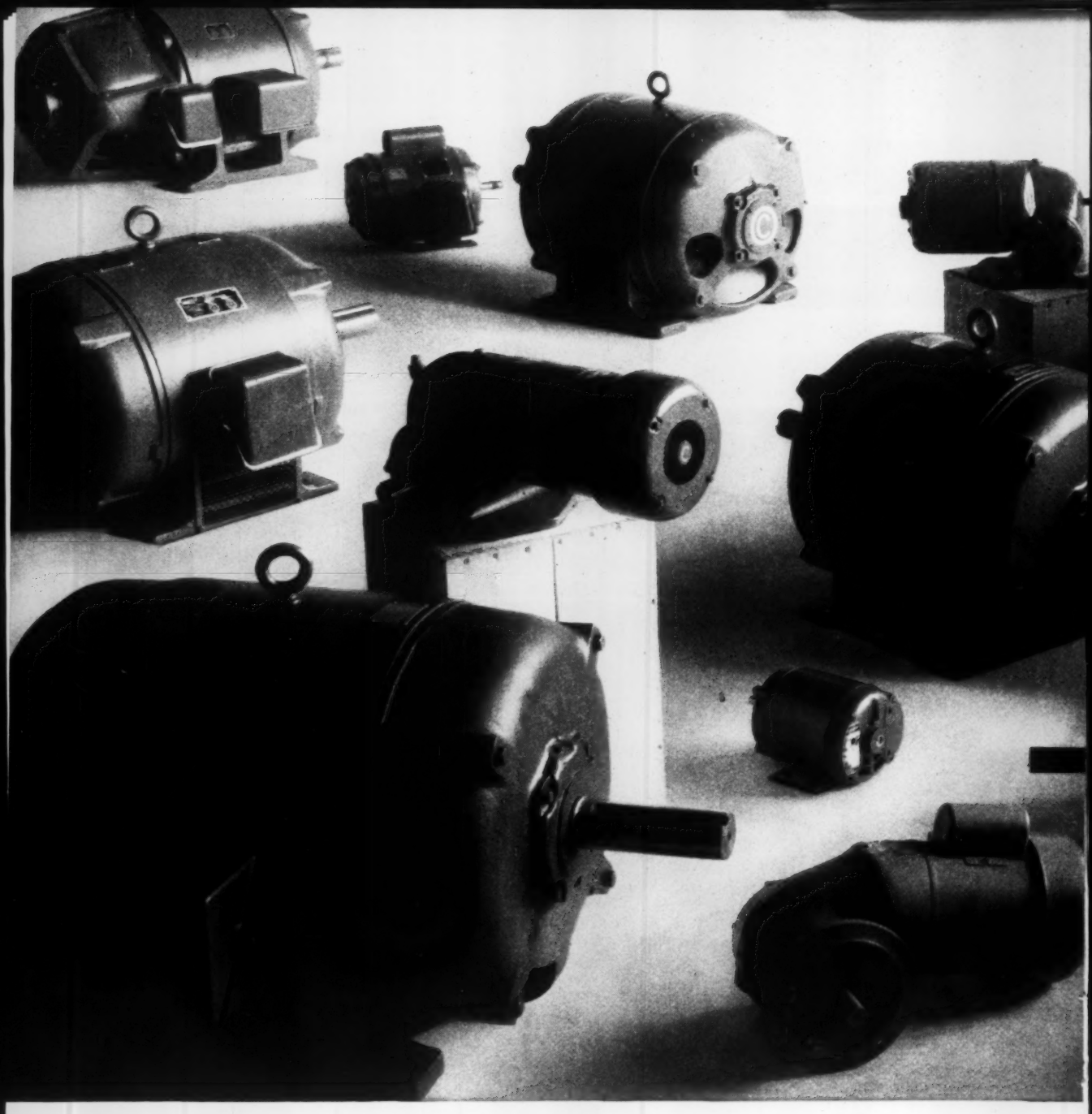
MESTA 51" Two-Stand Tandem Temper Mill Operating at the Yorkville Works of Wheeling Steel Corporation.

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA





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10,000 choices and advice on

You can't afford to take chances with the most vital link in your production line—motors. You can keep that link strong with Century Electric motors. Here's why:

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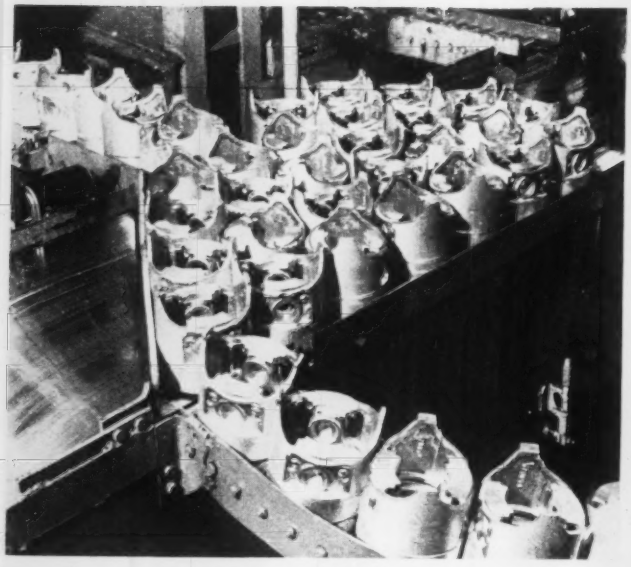
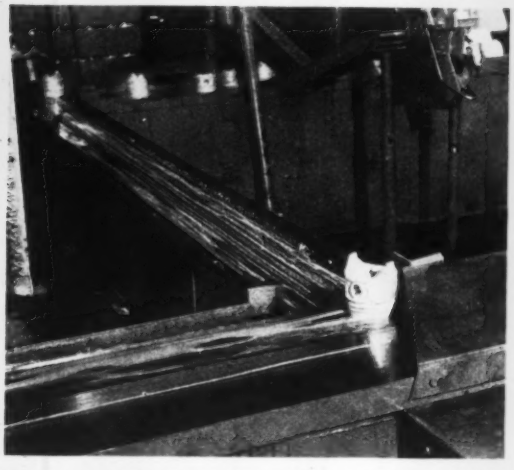


As pistons gang up, belt slides easily underneath them

Plow sends piston off belt to underpass conveyor



Thin cross section lets belts overlap closely

Belt Lets Parts Slide Freely

Piston machining line at Oldsmobile plant in Lansing, Mich., capitalizes on oil resisting and nonabrasive qualities of smooth steel conveyor belts. They have long life

SLIPPERY STEEL conveyors are a key feature of a new piston machining line at Oldsmobile Div. of General Motors Corp., Lansing, Mich. If pistons get backlogged, the belt slips smoothly under them without damage to the parts or belt.

Being impervious to oil and resistant to wear, the belts have extremely long life. (They are made by Sandvik Steel Belt Conveyors Div. of Sandvik Steel Inc., Fair Lawn, N. J.)

In the Oldsmobile installation, they are used as trunk line conveyors. Shorter steel belts plus gravity roller, vertical flight, and chain conveyors feed and remove parts from the trunk conveyors to automatically service the entire line.

Stainless or Carbon — Sandvik makes the belts in 18-8 stainless and carbon steel (0.65 carbon, 0.17 chrome). The carbon grade has good hardenability characteristics and is corrosion resistant enough to be in contact with water-soluble cutting oil.

It is heat treated in the same range as low spring steel.

After cold rolling and heat treating, the belt is trued and flattened to reduce camber.

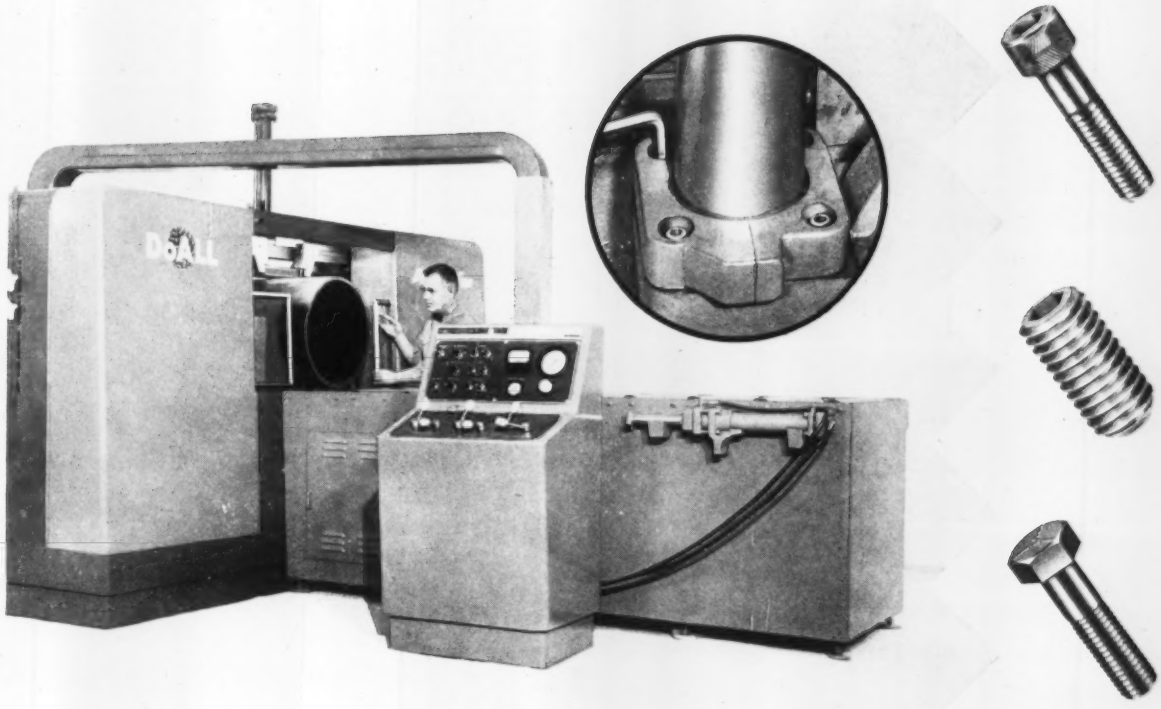
Stainless belts are rolled to Rockwell 40-42. They have a tensile strength of 156,000 to 170,000 psi.

Belts Run True—For truing, the belt is laid out on a long table. Straightness of the edges is measured and diagramed on the belt surface. Up to 2 in. variation can often be found in 400 ft.

To remove wiggle, the belt is run through truing rolls which are regulated according to the straightness diagram. Stresses are changed so that the final deviation from a straight band is less than $\frac{5}{8}$ in. The belt is spliced by overlapping the ends and riveting them with countersunk rivets which are filed smooth.

The belt is driven by a V-belt vulcanized to its underside. The simple friction device not only provides a positive drive but also assures true tracking.

IT PAYS TO STANDARDIZE ON **STANSCREW**



Stanscrew fasteners meet DoALL standards for high strength, rigidity, "clean" design

This outstanding machine was developed by the DoALL Company to handle industry's largest, toughest cut-off jobs. Not a beefed-up model of existing machines, this "biggest band saw built" is a unique new design. As one example, the cutting head travels vertically, but cutting takes place on the lower edge of the top saw band.

The new design of this unit, Model C24, therefore represents an entirely new concept of rigidity, applied power, and precision control. These basic considerations dictated the selection and application of every part . . . including, of course, the fasteners.

Small wonder, then, that DoALL's design engineers, after consultation with Stanscrew's fastener specialist, selected Stanscrew socket cap screws for vital applications such as attaching hydraulic cylinders. These reliable fasteners provide the high strength needed. Correctly applied, they give assurance against misalignment even after extensive use—a must in this precision machine. And, by permitting flush, snag-free surfaces, the fasteners also contribute to the C24's superior styling.

Like DoALL, other leaders of American industry are learning the advantages of calling in a Stanscrew specialist when a new product is on the drawing boards. His wide experience can often suggest ways to cut fastener or assembly costs . . . for example, by substituting a standard fastener for a costly special. He can make suggestions from Stanscrew's complete line of over 4,000 types and sizes, always in stock and quickly available.

So whatever your requirements in fasteners, call your Stanscrew distributor today. He will gladly arrange for a prompt visit from the Stanscrew fastener specialist.

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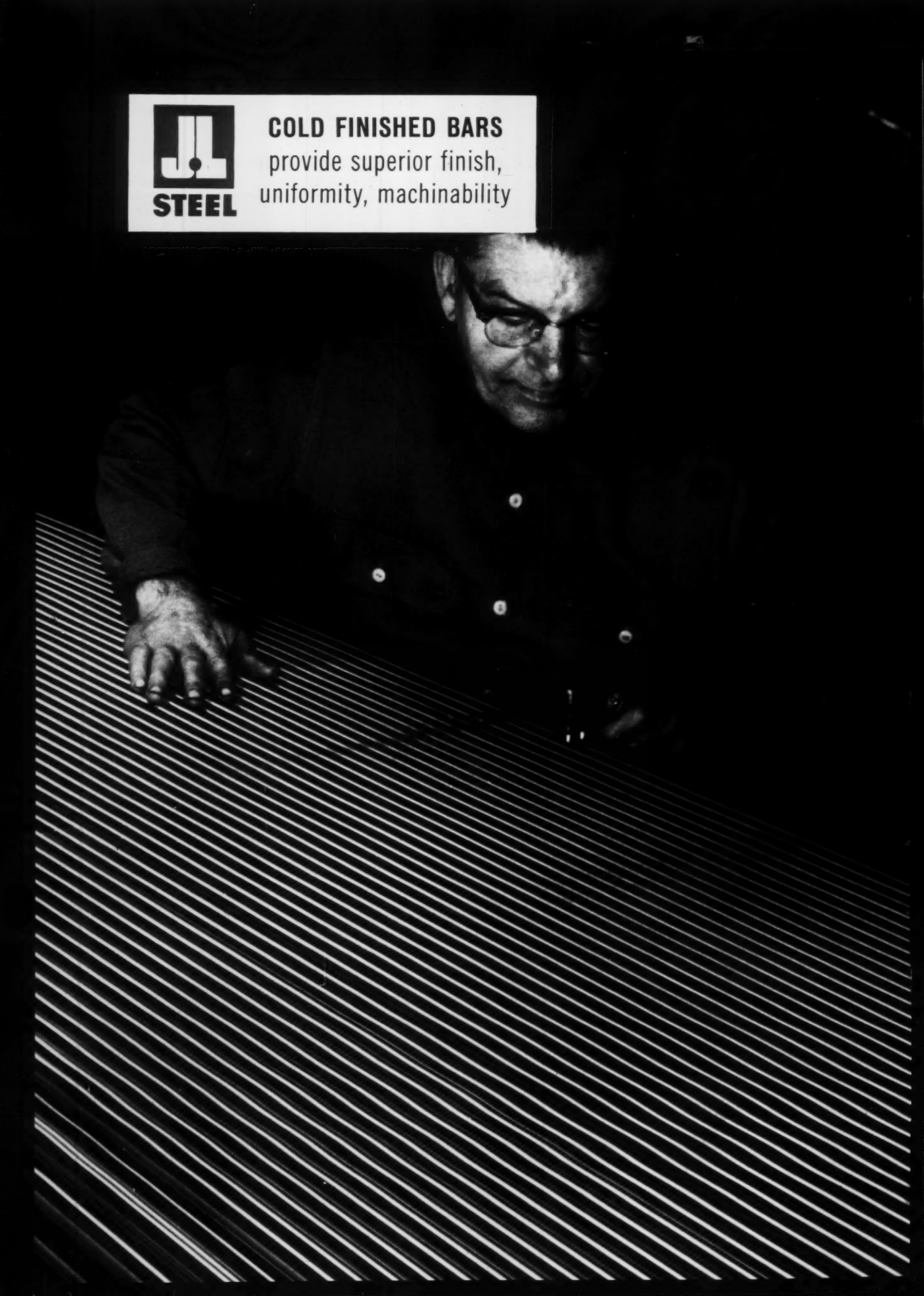
STEEL
COLD FINISHED BARS
provide superior finish,
uniformity, machinability

"J&L B-1113 leaded steel provides flawless finish, speeds machining of Singer sewing machine parts 35%"

"Flawless finish of 'Slant-O-Matic' hook assembly components machined from J&L B-1113 leaded steels, and carefully polished, prevents thread snags," according to officials of Singer Manufacturing Company.

With the "Slant-O-Matic" hook assembly moving at 3200 revolutions a minute, the slightest burr or tool mark on any part would snag the thread. Singer officials report the machined surfaces with J&L steel are "definitely easier to polish." They are now using leaded steel in over 100 components on the scores of industrial and household machines they manufacture.

"Use of cold finished leaded steel bars also speeds production 35% on our multiple spindle screw machines. And we get 25% longer tool life," Singer officials report.

Similar machining qualities and speed are possible in your operations with J&L controlled quality cold finished steel bars. A J&L steel specialist can recommend exactly the right steel for any job from J&L's complete cold finished line. Chances are he can help you get improved finishes, higher cutting speeds and longer tool life.

Call your local distributor, or write to Jones & Laughlin Steel Corporation, Dept. 543, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

J&L's B-1113 leaded steel permits 35% higher machining speeds in this multiple spindle screw machine operation at Singer Manufacturing Co., Elizabethport, N. J.

Superior surface finish of these hook assembly components prevents thread snags on Singer's "Slant-O-Matic" machines. Parts are machined from J&L leaded steel bars.

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

A MOMENT WITH MANAGEMENT...

INCREASED PRODUCTIVITY

means HIGHER PROFITS!

Cutting production costs adds directly to profit percentage. It eliminates production losses. Whether they be man-hours, machine time or material, you increase your profit spread.

A new tool is proving its ability to do just that! Many plants (large and small) have found that a total investment of a few hundred dollars actually saves them thousands monthly!

Testing is the new tool that offers immediate and future savings. It spots defects at the earliest possible moment, before a lot of money is spent working on material which can only end up in the scrap-pile.

HIGHER PROFIT PERCENTAGE will result because the returns will be increased from your present man-hours and plant investment.

THE SALES MANAGER will benefit from consistent reliable quality—increased customer satisfaction—reduced or stabilized costs—increased competitive ability.

THE PRODUCTION MANAGER will be able to maintain established quality levels (or meet new higher standards)—eliminate intermittent excessive scrapping of finished parts and often even reduce normal parts scrappage.

Can you afford to overlook these benefits? Write today for a free copy of "Lower Manufacturing Costs," an informative booklet. Or, ask our Field Engineer to discuss where and how low-cost Magnaflux Test Systems have helped others increase plant productivity.

The Hallmark of *Quality* in nondestructive test systems

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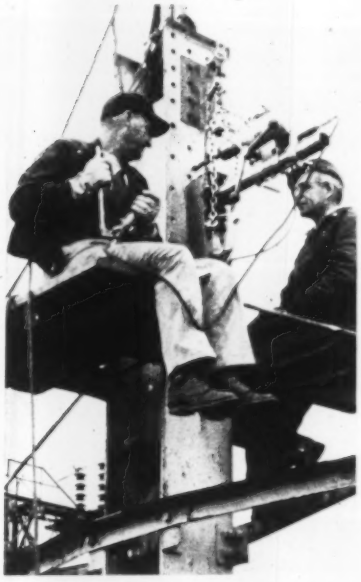
Idea for Drilling

Magnetism holds power unit in place on transmission poles. Makes job safer

A MAGNETIC drill press solved the problem of drilling 4000 holes in 14 in., wide flange steel columns 30 to 90 ft above the ground. Vare Bros. Construction Co., Ardmore, Pa., faced the problem when it wanted to add extensions to 50 transmission poles.

A Black & Decker 1¼-in. magnetic drill press with Hydra-Power feed was used. The magnetic base supported the drill, and holes were drilled hydraulically. All the operator did was position the drill and operate the hydraulic feed with a light pumping action.



MAGNETIC DRILL PRESS
. . . a pumping motion feeds it

The trigger switch released the magnetic power when moving the drill from hole to hole. A safety chain supported the unit while the operator used a pointer on the base to pinpoint the next hole location. Release of the trigger made magnetic contact instantaneous and secure.

The method eliminated the heavy labor of pushing a drill bit through ¾-in. steel and the danger of maneuvering a heavy tool high above the ground and close to high tension wires.

New Job for Hot Machining

Early reports from a research project show heat added to the workpiece makes superalloys easier to machine. In some cases, cutting temperature is actually lowered

HOT MACHINING, a dead issue for several years, shows new signs of life. Reason: The process that was tried on garden variety metals and failed for technical and economic reasons, may be the answer for today's supermetals.

The principle: Metals, like butter, cut easier when they're warmed up. The idea works on common steel and nonferrous materials, but the gains seldom justify the additional expense and job complexity.

Superalloys are an exception: There may be no other way to get the metal off in an economical fashion.

Explanation—Several researchers are exploring the worth of hot machining in this application. At the recent conference on "New Instrument Requirements for Metalcutting" at the University of Michigan, one speaker told of his experiments, and reported to STEEL that the process showed considerable promise.

A clue to this potential: Temperature at the tool tip is sometimes lower with hot machining than it is in conventional cutting. It means tool life may be increased.

Temperature is generated during cutting and is influenced by the forces required to take the metal off—the tougher the metal, the higher the forces, the higher the temperatures. The experts figured that with heat added to the workpiece before cutting, generated temperatures would go even higher.

But since the temperature of the work is increased, the strength of the material is lowered and less temperature is generated in the cut —enough less to offset the few hundred degrees added at the start.

Another Speaker — Dr. M. E. Merchant, director of physical research, Cincinnati Milling Machine Co., Cincinnati, said the transition in workpiece materials, from relatively free cutting to practically the other extreme, has given a critical role to metalcutting research.

Dr. Merchant says the average hardness of workpieces today is somewhere near 100 Brinell; and industry is spending about $10 billion a year to machine them. He predicts that if we continue to rely on conventional machining techniques, it will cost us roughly $100 billion a year to cut metal when the average hardness gets to 400 Brinell.

Fourth Quarter Sales?

Some machine tool builders, especially those selling the special machines, see the possibility of a fourth-quarter upturn. Several tell STEEL that new quotations have the look of solid business—more so than in recent months. A few programs (mostly automotive) look like sure things and add to the optimism. The best bet is that any upturn will be moderate—influenced principally by Detroit's 1960 plans.

Used Sales Drop Again

The Machinery Dealers National Association reports May sales of used machine tools show that their slump hasn't bottomed out. Dollar volume for the month was 5 per cent under the April level, 25 per cent below the same month last year.

ELECTRONIC and ULTRASONIC quality control of MUELLER rod, tube, fabricated parts and

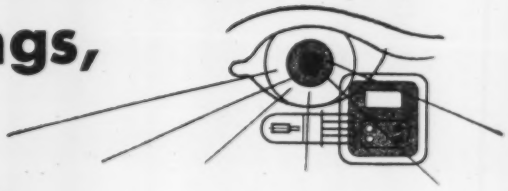
Every practical electro-mechanical testing device available to industry today is used by the Mueller Brass Co. to maintain Positive Quality Control during each manufacturing operation. From the first stages of alloying, spectroscopic analysis is used to maintain exact alloy composition so that they are precisely as specified. Ultrasonic test equipment is utilized in the non-destructive testing of extruded brass and bronze rod, copper tube, forgings and fabricated parts. In machining and finishing operations, statistical quality control is employed to eliminate the effect of possible human error. These quality controls are all designed for one purpose . . . to give you complete "product protection."

•

Copper base alloy rod is examined by a trained operator with the aid of an ultrasonic reflectoscope. Through electronic circuitry, ultrasonic echoes are translated on a cathode ray tube. Any internal flaws are readily apparent. Both rod and tube are tested by this method, which is just one of many Positive Quality Control checks used by the Mueller Brass Co.

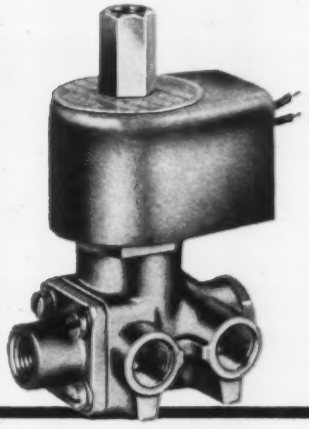
Through ultrasonics, the immerscope (Left) locates internal defects, and has exceptional versatility for examining intricately shaped parts, such as the forging being checked in this photo. When testing, a transducer, located at the bottom end of the search tube, is electronically actuated to produce from 2.2 to 25 million cycles per second. Ultrasonic echoes are reflected back to the transducer from the material, indicating any defects that may be present. Limits may be pre-established and the sound findings are visually recorded on the cathode tube. This is another instance of Positive Quality Control in action.

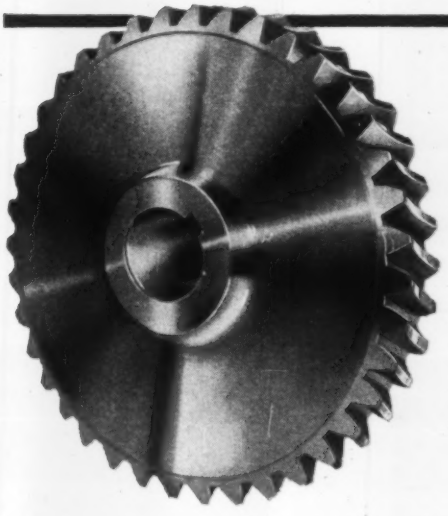
TESTING helps insure positive BRASS CO. forgings, assemblies . . .



The direct reading spectrometer (Left) makes it possible to accurately analyze an alloy for chemical composition within 90 seconds while the metal is in the molten stage. A sample specimen is poured, cooled and sent to the laboratory, where it is placed in the spectrometer. Through the diffraction gratings in the machine, the "spectrum" analysis of the alloy records its exact chemical composition. With this equipment, alloy specifications are matched exactly, thus insuring a better finished product through Positive Quality Control.

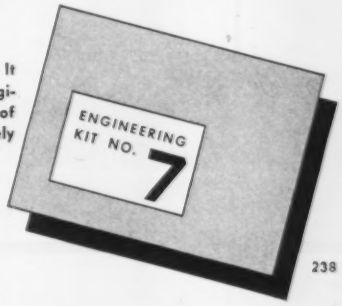
THIS MIDGET 4-WAY SOLENOID VALVE (Right) is one of a complete line designed and manufactured by the Automatic Switch Co. (ASCO) of Florham Park, New Jersey. Valves of this type are used for controlling small double acting cylinders which operate valves, dampers and many types of automatically controlled equipment. One of the most important components in these valves is the non-porous brass body forged by the Mueller Brass Co. who also perform all the major machining operations so that the body is ready for use upon delivery. The forged brass body insures freedom from porosity and reduces possibility of corrosion. The Mueller Brass Co. Positive Quality Control program insures ASCO complete "product protection". . . and eliminates chance of "in-service" failures.





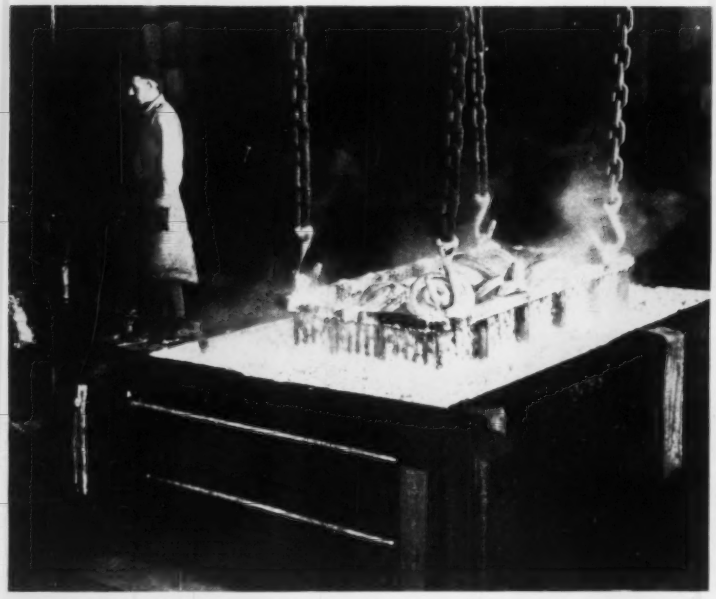
THIS LARGE 18" FORGED GEAR, along with two others of the same type, is used in a steam turbine installed in a power generation facility of the Wisconsin Electric Power Company, at Port Washington, Wisconsin. The gear was forged in open dies by the Mueller Brass Co. from tough, long-wearing 603 alloy. The gear operates at 25-30 RPM and is turned by the turbine, which has a capacity of 80,000 kilowatts. Strength and dependability are of utmost importance in applications like this, and in such cases Positive Quality Control insures peak performance.

Write for your engineering kit no. 7. It contains complete laboratory and engineering data plus typical examples of Mueller Brass Co. products used in widely diversified applications.



238

MUELLER BRASS CO. PORT HURON 26, MICHIGAN



These castings are being lifted from a sulfuric acid bath. Crate holds 4000 lb, a third more than previous type. Monel rods holding vat are used as hooks when wood sides wear out

Monel Crates Shave Repair Costs

Hot pickling acids and rough treatment add up to high operating costs when you use "adequate" metals. Here's how a firm found it pays to look beyond first costs

LOOKING for ways to reduce the maintenance and repair costs of handling equipment exposed to corrosives and rough treatment? Nickel-copper alloys are recommended by Transue & Williams Forging Co., Alliance, Ohio.

The company was plagued with the high repair cost of pickling equipment, particularly crates. (Transue & Williams makes precision carbon and alloy steel forgings, gears, axles, tractor links, and valve parts.)

It previously used regular copper-base alloys. Service life was short; crates were constantly falling apart. Brazing was the only practical method of repair, and joints didn't hold up too well. In addition, operators had to be careful not to overload the crates.

At first, engineers sacrificed some metal strength to get corrosion resistance, but the units were heavy. Batch loads were reduced and production time increased. The move backfired: Exposed for a longer time to the corrosive solution, crates were attacked even more by the acid. (The firm uses a 12 to 15 per cent sulfuric acid solution at 180° F.)

Switched Horses—Monel crates, the next move, gave immediate results. Earl Cunningham, supervisor of heat treat and pickling, says: "Present indications show that the crates will last more than 11 years."

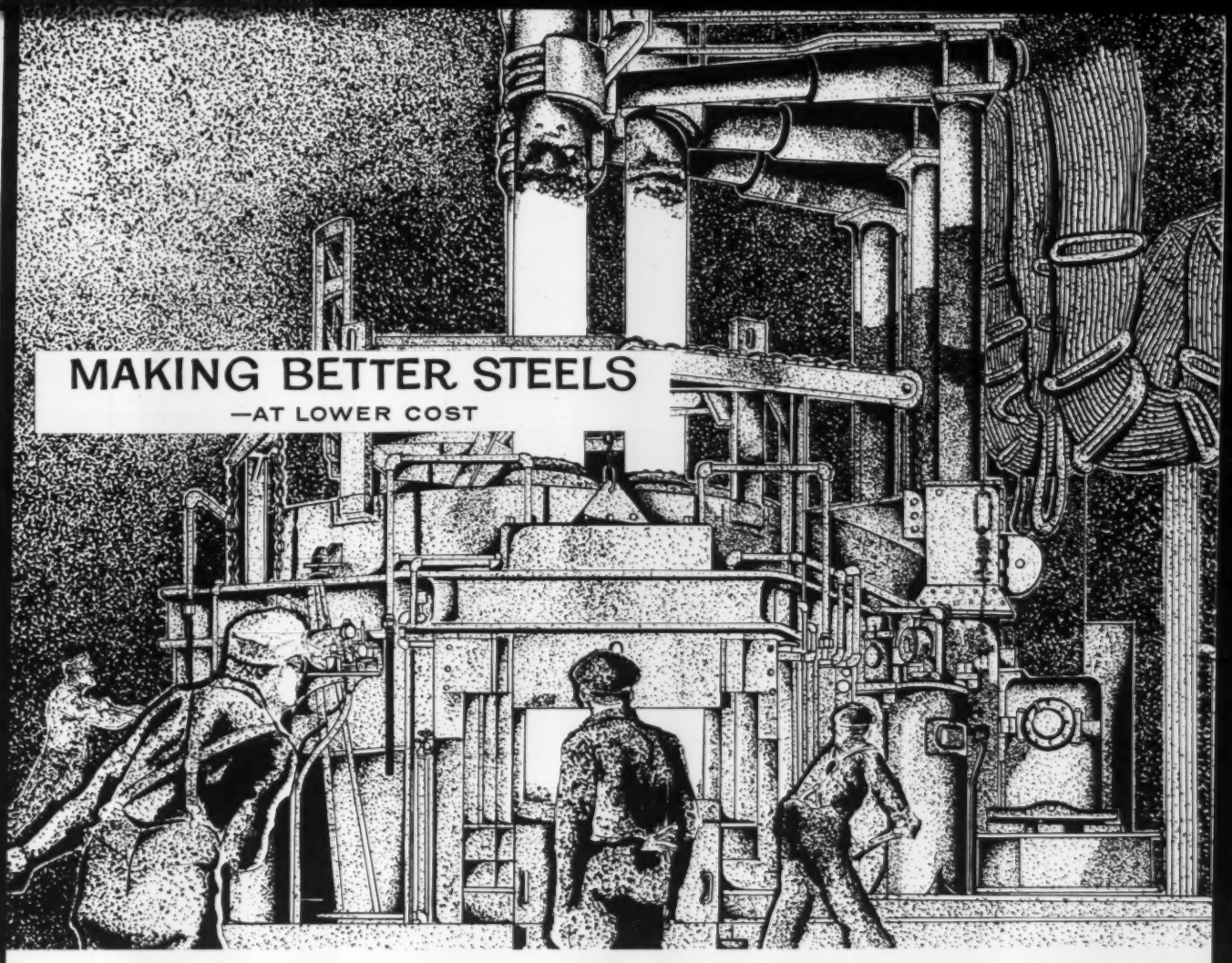
He also points out that the new crates are lighter and more durable than the old ones. The pay load per batch was increased 25 per cent. "Since we ship 5 million lb of forgings a month, that is important enough to more than justify the difference in cost."

Workmen no longer have to baby the crates. One load may contain lightweight parts weighing a pound or less each; the next one could hold 600-lb pieces.

Repair is comparatively simple. Monel welds easily, and its repairs are as strong as the parent metal.

The company uses Monel crates exclusively. Each is 30 in. high, 32 in. wide, and 6 ft long and can carry 4000 lb, a third more than that used previously.

Tried Elsewhere—The alloy has been put to good use in other equipment. Monel tierods hold wooden vats together. They outlast the vats, and when a vat is replaced, the rods are converted into pickling hooks.



ADDING ALLOYING ELEMENTS

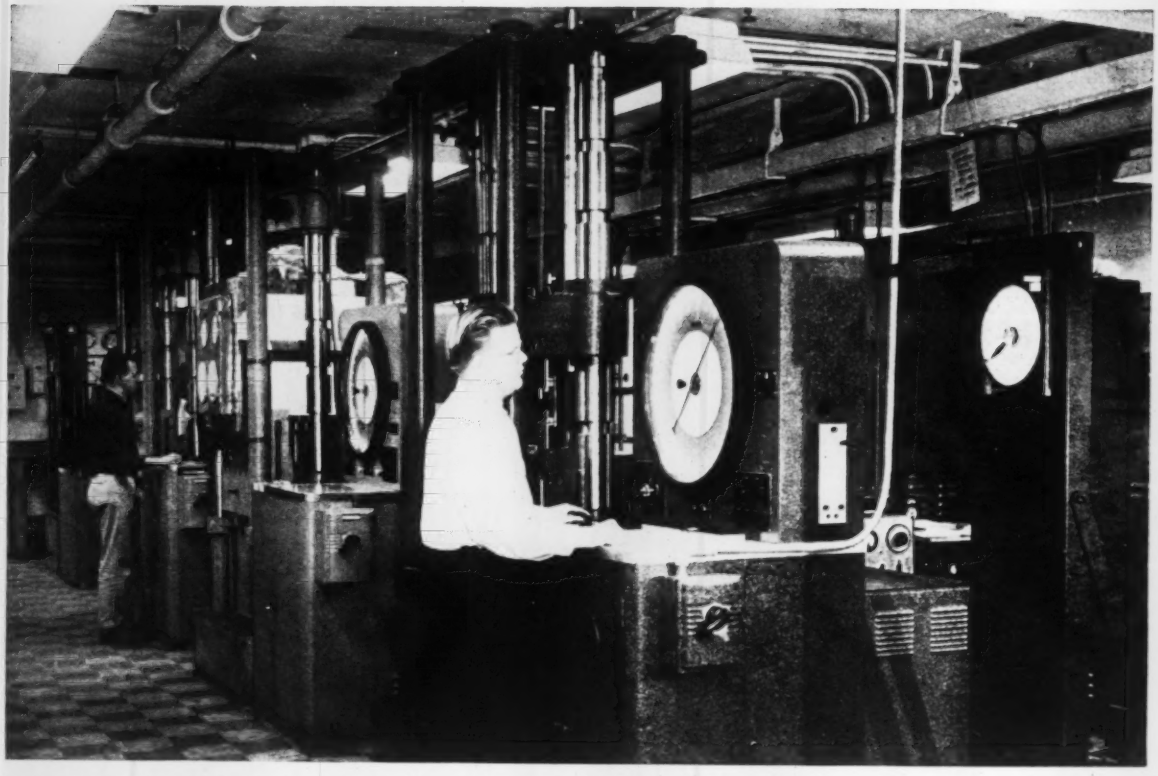
. . . to the bath requires the experience of melters who know how to control the important factors of time, temperature and quantity. Skilled melters also know that a **GLC graphite column with the "weld-strength" Unitrode nipple** helps make better steel at lower cost.

FREE—*This illustration of one of the skills employed by the men who make the metals has been handsomely reproduced with no advertising text. We will be pleased to send you one of these reproductions with our compliments. Simply write to Dept. S-7.*

ELECTRODE GLC® DIVISION

GREAT LAKES CARBON CORPORATION

18 EAST 48TH STREET, NEW YORK 17, N.Y. OFFICES IN PRINCIPAL CITIES



Large static testers apply tension, compression, or alternating loads. Each has a capacity of 150,000 lb

Space Age Test Program

Thorough study of the properties of new materials and new configurations are needed to support designwork. This missilemaker maintains two large labs

COMPREHENSIVE testing is the key to successful production of aircraft and missiles, says the Martin Co., Baltimore.

The firm has two large labs: One for static tests and one for fatigue tests. Results, say researchers, have much to do with finding the right materials for missiles and the Seamaster, which may become our first atomic powered airplane.

Many Faceted Program—In their search for better materials, Martin researchers are breaking, bending, tearing, and beating alloy steels, titanium, magnesium-thorium alloys, beryllium, boron, hot-work die steels, and precipitation hardening stainless. Some studies last three days. Testing machines that assure such constant performance were made by the Electronics & Instrumentation Div., Baldwin-Lima-Hamilton Corp., Waltham, Mass.

To investigate the behavior of metals at high temperature, Martin uses resistance heating and testing furnaces. A test piece can be resistance heated to 3000° F.

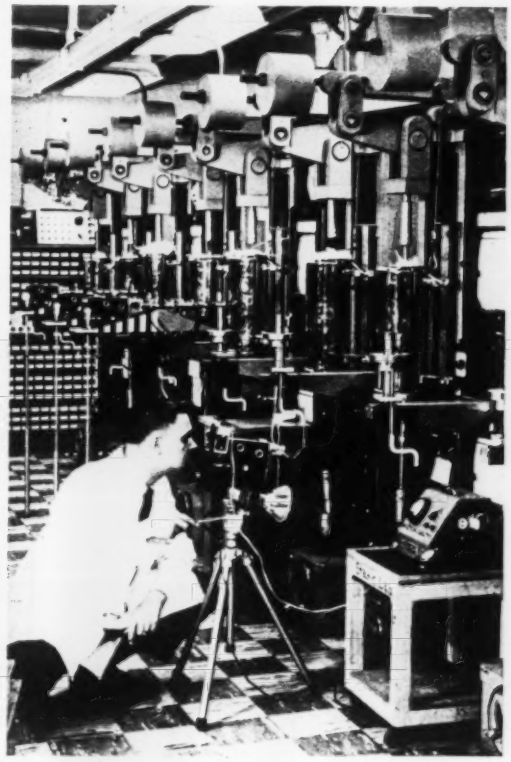
Two types of furnaces are available to researchers: The flexure testing furnace, a circulating air unit built by Marshall Products Co., Columbus, Ohio (it reaches temperatures of 1350° F); and a tubular, split-type furnace built by Hevi-Duty Electric Co., Milwaukee (it goes up to 1800° F).

Stainless steel honeycomb for the Titan ICBM was fatigue tested in the flexure furnace. Tests were run at 1200 cycles a minute with 0 to 12,000 lb loads at 1000° F.

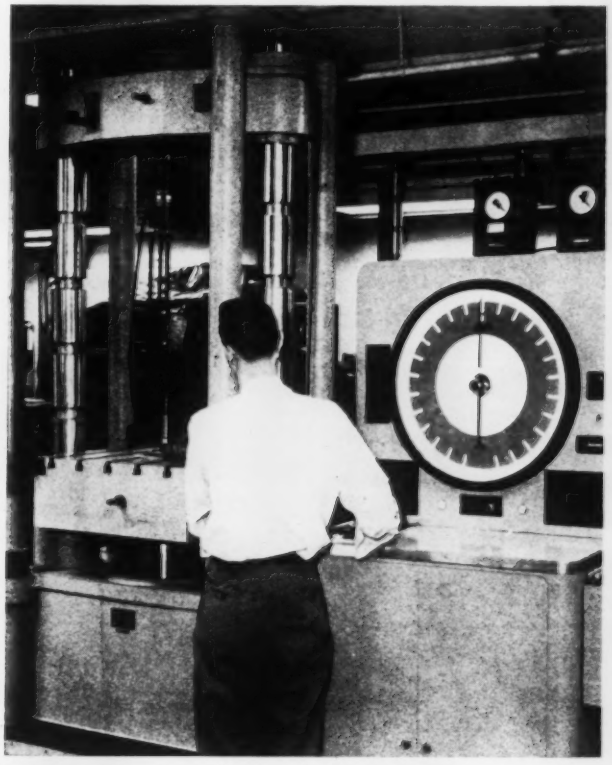
Martin uses the Hevi-Duty furnace for testing small components such as the 4 per cent aluminum, 4 per cent manganese-titanium bolts made by Standard Pressed Steel Co., Jenkintown, Pa., for the P6M Seamaster.

Laboratory Equipment—The fatigue lab has eight testing units. Six have operated almost continuously for six years. Fatigue samples are usually tested at 1800 cycles a minute, with loads of 1000 to 25,000 lb. Two of the machines (the lab's most recent acquisition) are designed to test dynamic creep, an important criterion for missile materials. The equipment compensates for the creep, holding the static and dynamic loads constant.

Seven testers with capacities of 5000 to 400,000 lb make up the static test lab. Three 150,000-lb machines which were added recently are used for hysteresis studies, ten-



Creep tests are recorded on calibrated motion picture film. Deformation is read to 0.00001 in.



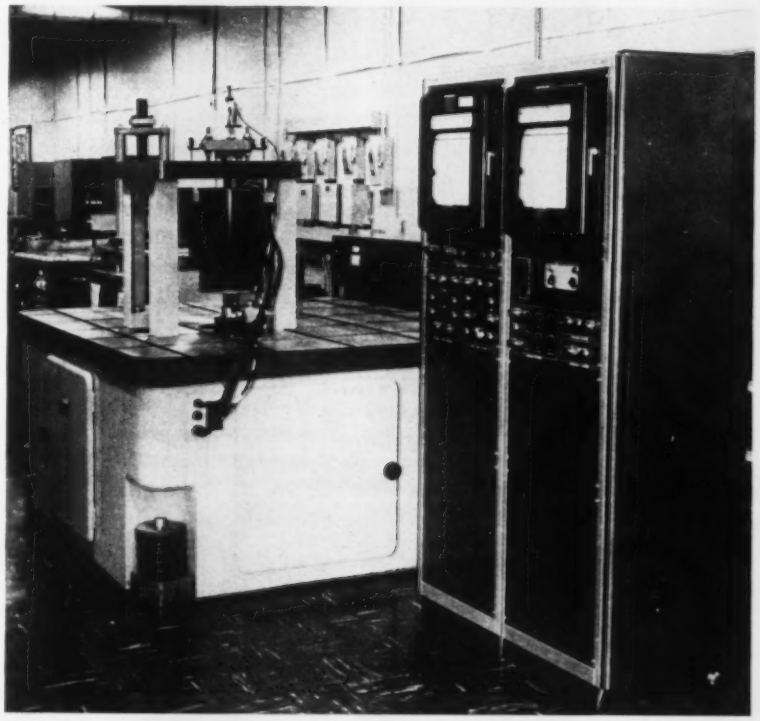
A load cell (cylinder with nameplate) checks the strain during rapid loading. The specimen fails in 1 second

sion, and compression tests on such components as the nose cone of the Vanguard missile. A holding mechanism that keeps the load constant for any period eliminates the need for a full-time operator.

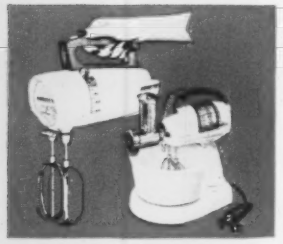
The machines can be used as 150,000-lb fatigue testers if a rate of 20 cycles a minute is suitable. A sample can be tested in both tension and compression between the single testing head and the table. A program of strains can be applied to the test sample, simulating the history of the part in service. Martin plans to use a tape program that feeds all values simultaneously—time, load, and temperature. Temperature changes will be obtained by heating the specimen electrically, or by surrounding it with heating elements.

Creep testing is done on eleven 20,000 lb and three 12,000 lb testers. A photographic measuring process makes it possible to read 0.00001 in. of creep. Strain gages and load cells are used for auxiliary measurements when loading is rapid.

Data Correlated—All data from

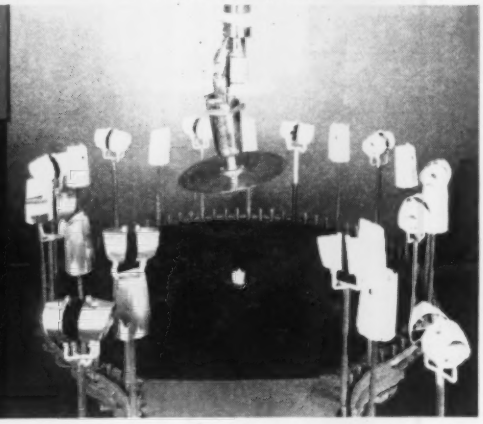


Aircraft components are tested through 10 million cycles on this machine. The furnace provides temperature control



DORMEYER MIXERS
are painted with
RANSBURG
NO. 2 PROCESS

. . . and high quality standards
are easily maintained with Electrostatic Spray Painting



Aluminum and zinc die castings of the Dormeyer Mixers are painted uniformly as the parts make a loop around the RANSBURG disk in the job painting plant of Enameled Steel & Sign Co.

● Enameled Steel & Sign Co. is able to serve many customers like Dormeyer, for their Chicago job painting plant is equipped with modern and efficient finishing facilities for producing high quality, high volume painting.

Electrostatic spray painting has practically replaced all other methods here, for the flexibility and near 100% efficiency of the Ransburg No. 2 Process enables Enameled Steel to serve many manufacturers of a wide variety of products. And, this with a comparatively small labor crew!

Today—with Ransburg No. 2 Process—Enameled Steel is realizing more than 60% paint savings over former hand spray. Rejects have been cut to less than 1%, for the Ransburg No. 2 Process applies a uniform, high quality finish never before obtainable with old-fashioned painting methods.

THINK OF WHAT 60% PAINT SAVINGS WOULD MEAN IN YOUR OWN FINISHING DEPARTMENT

Whatever you manufacture, if your production justifies conveyorized painting, you should look into the savings and improved quality which can be yours with Ransburg Electro-Spray. Let us tell you about the complete Ransburg services, including the test painting of your products in our laboratories.

Ransburg **ELECTRO-COATING CORP.**
Indianapolis 7, Indiana

RANSBURG

each test are accumulated as a permanent record of metal specimens, small parts, components, and structures. Where mathematical correlation of data on the same piece or on combinations of pieces is required, the information is fed to a Benson-Lehner Boscar which computes the values.

Diecasting Improves Part

Fabrication costs were cut 30 per cent by using zinc diecastings for calibrated clamps. (They are components for carbide tool grinder tilting tables made by Baldor Electric Co., St. Louis.)

Other benefits: Secondary operations were eliminated, and an angle index plate (calibrated in degrees) could be designed as an integral part of the casting. Before redesign, it was a separate part that had to be drilled and bolted onto a holding device.

Production Speeded — Five machining operations were eliminated: Milling two slots, milling two sides, and drilling. No finishing is required. Complete fabrication consists of casting and trimming.

Each hour 160 to 180 table clamps are cast in the single cavity dies.

The chief problem was keeping ± 0.002 in. tolerance on the arc. It was solved by making the core for the pivot slot slightly ovate to compensate for shrinkage.

Shear Cuts on Upswing

A 1000-ton, up and down shear which cuts on the upstroke of the bottom blade is used to process hot steel blooms up to 16 in. square and slabs up to 6½ by 42 in. It was designed and built by Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

Since the knife cuts as it rises, depressing tables are not needed. A holddown device is linked to the bottom knife during the cutting stroke. This clamping action holds the work firmly in the cutting plane. Ends are cut square and are free from hook.

The air-clutch operated machine uses a flywheel drive. It eliminates direct drive and the need for larger direct-current motors. An alternating current, air cooled motor (200 horsepower) is used.

Grinder Holds Accuracy over Large Work Area

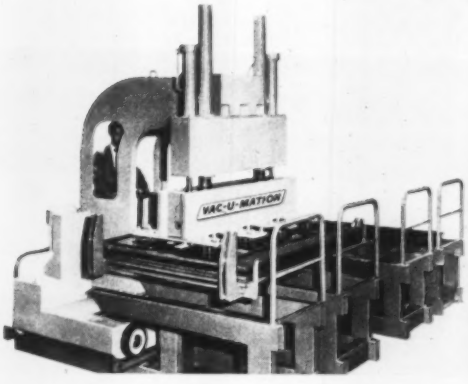
This Hydrail surface grinder was designed to grind the ways of large machine tools; it has a work area of 48 x 36 x 240 in.

It is equipped with a Hydra-Cool hydraulic system which reduces hydraulic heat to a minimum and eliminates heat distortion throughout the machine. An accuracy within 0.0007 in. can be held over the machine's entire work area.

Antifriction, recirculating ball nuts reduce friction between nut and screw, position the rail accurately without counterbalancing, and extend screw life.

The grinder can be operated from either side by dual manual controls and a pendant electrical control station. *Write*: Thompson Grinder Co., Springfield, Ohio. *Phone*: Fairfax 3-3723

Lifting and Moving Unit Handles 5 Tons by Vacuum



The Vac-U-Mation combination vacuum plate lifter and feeder handles single or multiple plate loads from 2000 to 10,000 lb. It can be supplied with extension arms for lifting and moving 10 x 40 ft plates.

The unit rides on rails and can be made partially or fully automatic with remote controls.

Vacuum is produced by two pumps; one can hold the load if the other fails. The lifting safety factor is better than 3 to 1 with 10,000 lb. In the event of complete power failure to the pumps, the safety tank will hold a maximum load for 5 to 10 minutes.

Lifting is done hydraulically. *Write*: Dept. 4-D, Vac-U-Mation Div., F. J. Littell Machine Co., 4127 N. Ravenswood Ave., Chicago 13, Ill. *Phone*: Ravenswood 8-3322

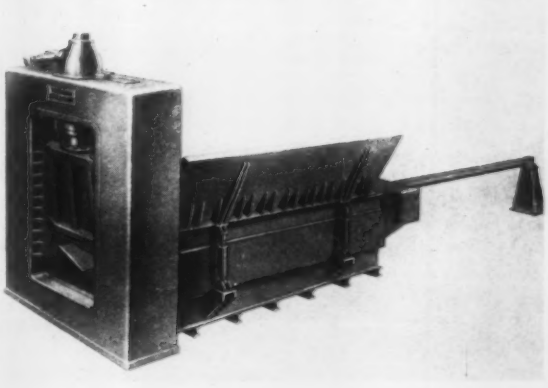
Hydraulic Shear Handles Heavy-Duty Scrap Operations

It is estimated that this 750-ton hydraulic scrap shear will cut 150 tons of miscellaneous scrap or 250 tons of uniform plate scrap in an 8-hour day. It has a force of 750 tons and will cut up to 7-in. diameter steel rounds.

Movements are controlled by pushbuttons from one station. The gathering cylinder controls have adjustments for cutting from 18 to 60 in.

Four pumps, each having a displacement of 55 gpm at 2000 psi, are mounted on a reservoir-type tank, and are driven by two 125 hp, 1200 rpm electric motors.

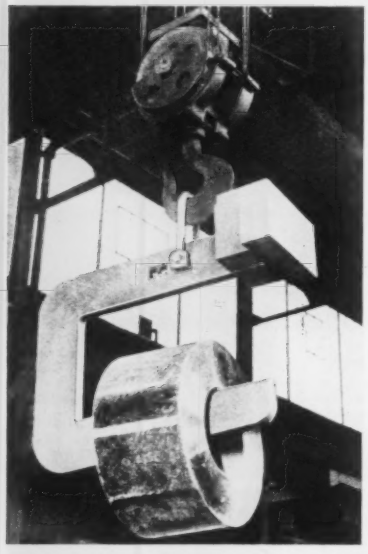
The stroke is 36 in. and the charging box is 24 ft long, 6 ft wide, and 30 in. deep. *Write*: Watson-Stillman Press Div., Farrel-Birmingham Co. Inc., 565 Blossom Rd., Rochester 10, N. Y. *Phone*: Butler 8-4600



NEW PRODUCTS and equipment

Hook's Lip Protects Coil

Standard design "C" hooks in capacities from 4000 to 40,000 lb incorporate half-round bearing strips on the carrying lips to provide greater bearing on coils and prevent marring of high-grade surfaces.



The hooks are accurately balanced for quick coil pickup and accurate spotting when the load is set down. Forged steel shackles insure maximum strength and safety.

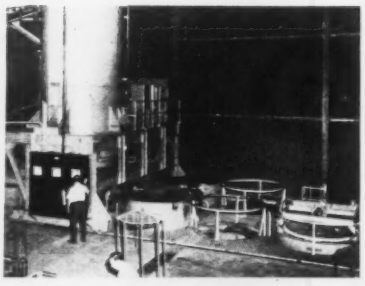
The main member is made of a single steel plate, finished to shape, with rounded inside corners to prevent excessive stress concentrations and damage to coil inner wraps. *Write*: Cullen-Friestedt Co., 1300 S. Kilbourne Ave., Chicago, Ill. *Phone*: Crawford 7-4300

Furnace Spans Operations

The frame of this controlled atmosphere hardening furnace is raised on side supports to span a preloading station or adjacent oil and salt quench tanks.

Pushbotton control of the furnace door, winch, and longitudinal travel is provided. The operator's platform is built into the side of the base structure. Three recording pyrometer panels, one for each zone of control, automatically maintain the required temperature.

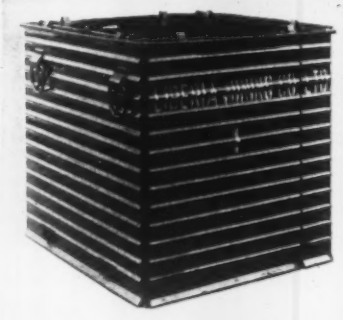
A reinforced shell, 9 ft in diameter by 16 ft deep, is welded gastight throughout to prevent contamination of the atmosphere. The shell will accommodate a loading fixture with an effective workload 12 ft long by 5 ft in diameter. *Write*: Heat Treating Div., Lindberg Engineering Co., 2450 W. Hubbard St., Chicago 12, Ill. *Phone*: Monroe 6-3443



Shipping Box Collapsible

A reusable steel "transporter" box designed to fold into 1/5 its original size after unloading is intended for one-way shipment of materials. It is specially suited for foreign cargo shipments.

The box is particularly useful for freight that requires protection from rough handling and pilferage. For further security, the boxes can be supplied with heavy duty locks.



Welded brackets are provided with steel rings for crane hook pickup. Boxes come in sizes ranging from about 48 in. square to 60 in. square. *Write*: Berger Div., Republic Steel Corp., 1038 Belden Ave. N. E., Canton 5, Ohio. *Phone*: Temple 3-4131

Large Capacity Jig Borer

A precision jig borer, the 4EA, is capable of locating to 0.0001 in., can accommodate workpieces as high as 70 in., and can bore to the center of a workpiece 80 in. in diameter.

In addition to its great table-to-spindle distance, the unit provides a combined head and quill travel of 64 in. As a result, the spindle nose can be brought within 6 in. of the table surface, and thinner work can be handled without using subtables —a potential source of inaccuracy.

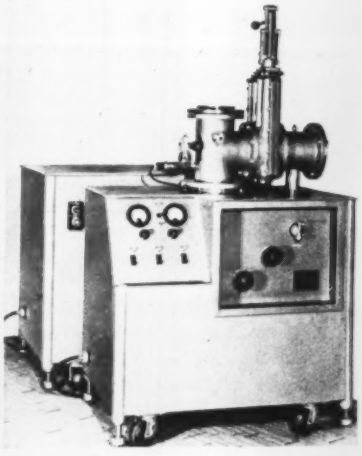
Despite its high column, the machine has a highly accurate vertical alignment.

Models are available with numerical control. *Write*: Pratt & Whitney Co. Inc., West Hartford 1, Conn. *Phone*: Adams 3-7561

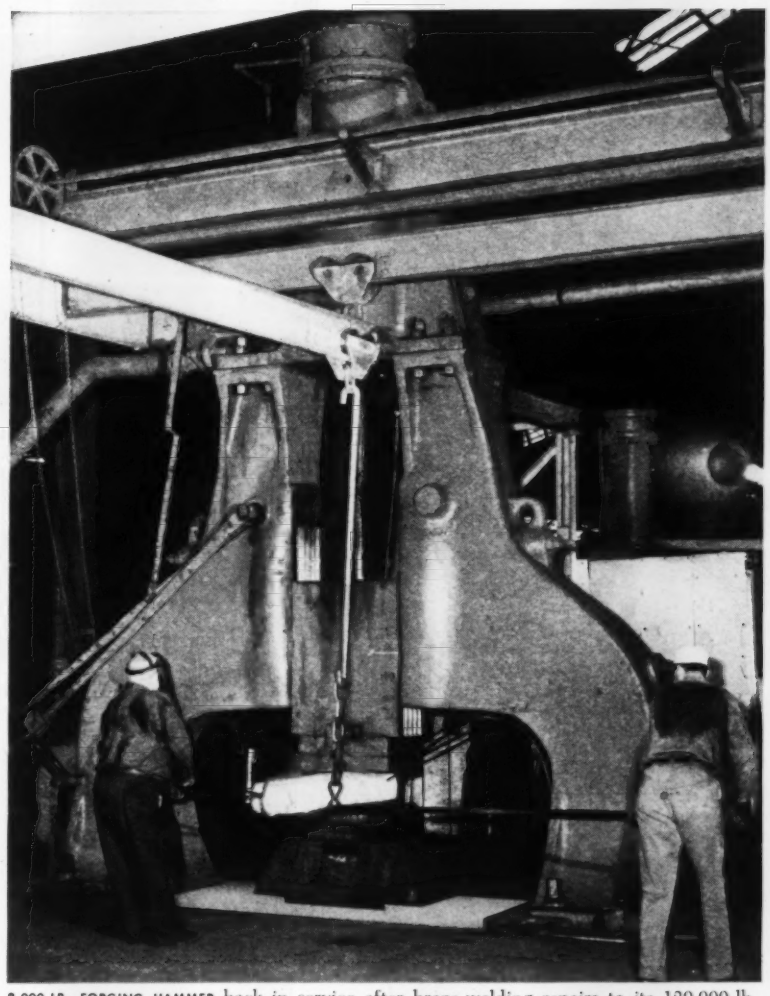
Produces High Vacuums

Vacuums better than 5×10^{-7} mm Hg are possible with the multiple vacuum pumping system of the Model SCEL-6246.

This unit is suited to scientific and engineering applications including thermal reduction distillation of metals, vacuum sintering, heat treatment, vacuum melting; vacuum evaporation to form low reflection



RECORD BRAZE-WELDING REPAIR ON 60-TON HAMMER BASE PREVENTS 8 MONTHS' LOSS OF PRODUCTION



8,000-LB. FORGING HAMMER back in service after braze-welding repairs to its 120,000-lb. anvil, which extends 8 feet below floor level. Color shows location of repair weld.

WHEN the 60-ton, semi-steel base of a big forging hammer at the Jessop Steel Co., Washington, Penn., fractured, management had to make a quick decision. Ordering a new base meant that the hammer would stand idle approximately nine months. Consultation with Maintenance Engineering Corp., of Pittsburgh, specialists in the repair of heavy machinery, showed that the base could be repaired by braze-welding at a big saving in time and money.

Maintenance Engineering got the go-ahead and completed the weld in one week*—a saving of eight months' production time—*at 20% of replacement cost.* "We are very pleased with the savings in down time and cash," says Mr. H. K. Taylor, Vice President in Charge of Operations of Jessop Steel Co. "The hammer has been back in service now for over six months and the braze metal is just an integral part of the base."

**Including preparation, machining and welding—total of 3 weeks.*

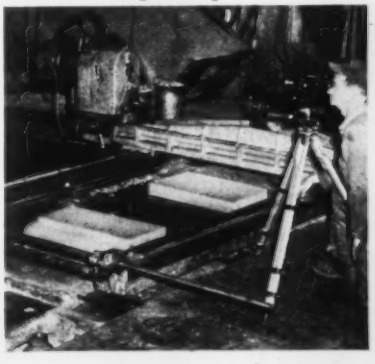
Always consider braze-welding repair. No matter how bad or how big the break in industrial equipment, it pays to investigate the advantages of repairing it by braze-welding. The savings possible in production time and cost are often surprising. Oxyacetylene braze-welding with Anaconda-997 (Low Fuming) Bronze and Tobin Bronze*-481 Welding Rods is receiving increasing recognition as the easiest and least expensive method of making strong, lasting repairs. For more information and technical assistance on your welding problems, write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 58106

ANACONDA®
WELDING RODS
MADE BY
THE AMERICAN BRASS COMPANY

PREPARING FRACTURED SURFACE of anvil to produce a smooth surface with overlap margin. Dotted lines show original outline.

ABOVE: Completed weld which used 2,350 lb. of Tobin Bronze-481 Welding Rod.

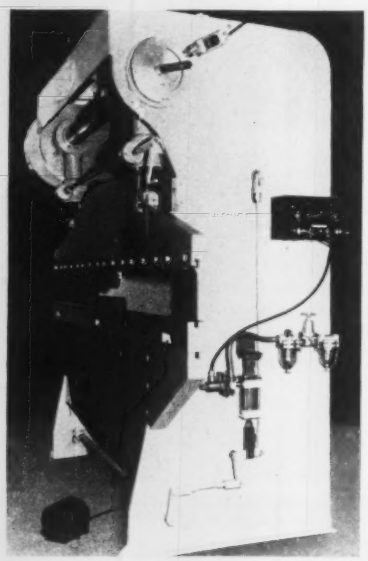
BELOW: A portable planer was used for finish-machining the repaired anvil.



coatings, reflection surfaces, decorative coatings; and vacuum sputtering of nonconductors. *Write*: Scientific Engineering Laboratory, 1510 Sixth St., Berkeley 10, Calif.

Unit Controls Brake

The Joggit automatic brake control mounted on any press brake is designed to eliminate whipping and assure uniform bends with increased production. An unskilled operator can handle it.

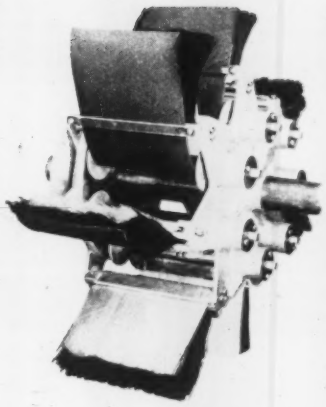


Automatic features include: Stopping of the ram just above the work by means of a preset dial, uniform ram movement through the work at a preset rate, return of the ram on the upstroke, stopping of the ram at top dead center, and hesitation at a predetermined point of the downstroke. *Write*: General Automation Corp., 40-66 Lawrence St., Flushing 54, N. Y. *Phone*: Hickory 5-7300

Replaces Worn Abrasive

The Smooth-O-Matic coated abrasive head for finishing metals carries a supply of abrasive for replenishing worn material.

Cloth or paper backed silicon carbide or aluminum oxide abrasive is fed from rolls which are automatically advanced (activation can be manual or by solenoid). Heads are available in abrasive widths of

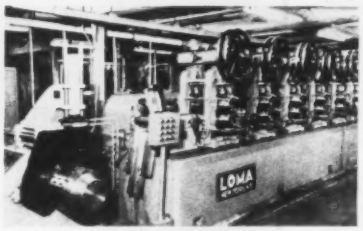


2 to 50 in. *Write*: Dept. H-297, Abrasive Machinery Corp., 444 S. Pennsylvania St., Indianapolis 25, Ind. *Phone*: Geneva 4-0550

Fast Mill for Thin Strip

This high speed, cold reduction mill for continuous rolling of thin strip is compact. Eight individual 6 in. diameter x 8 in. face, 2-high mill stands are mounted with their drives on a common base.

The machine is normally fed with annealed reroll stock ranging from 0.072 in. to 0.093 in. thick. The unit illustrated has output speeds up to 1000 fpm.



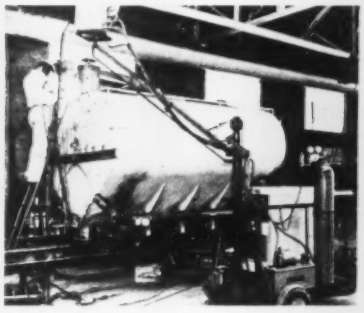
The mill's heavy duty, precision design allows it to take total reductions of 95 per cent while maintaining tolerances as close as 5 per cent of thickness. *Write*: Loma Machine Mfg. Co., Inc., 114 E. 32nd St., New York 16, N. Y. *Phone*: Murray Hill 5-6410

Welding Area Increased

A steel cage assembly holds and protects semiautomatic welding control and wire feed units and provides increased flexibility. It is especially useful to shops fabricating large weldments.

The assembly can be raised, lowered, and moved to any welding position, enlarging work areas and providing flexibility within the limits of the type of crane used.

The unit was designed to hold NCG SA control and wire feed



units but will handle other equipment. *Write*: National Cylinder Gas Div., Chemetron Corp., 840 N. Michigan Ave., Chicago 11, Ill. *Phone*: Bishop 2-3083

Truck Handles 8-ft Cargo

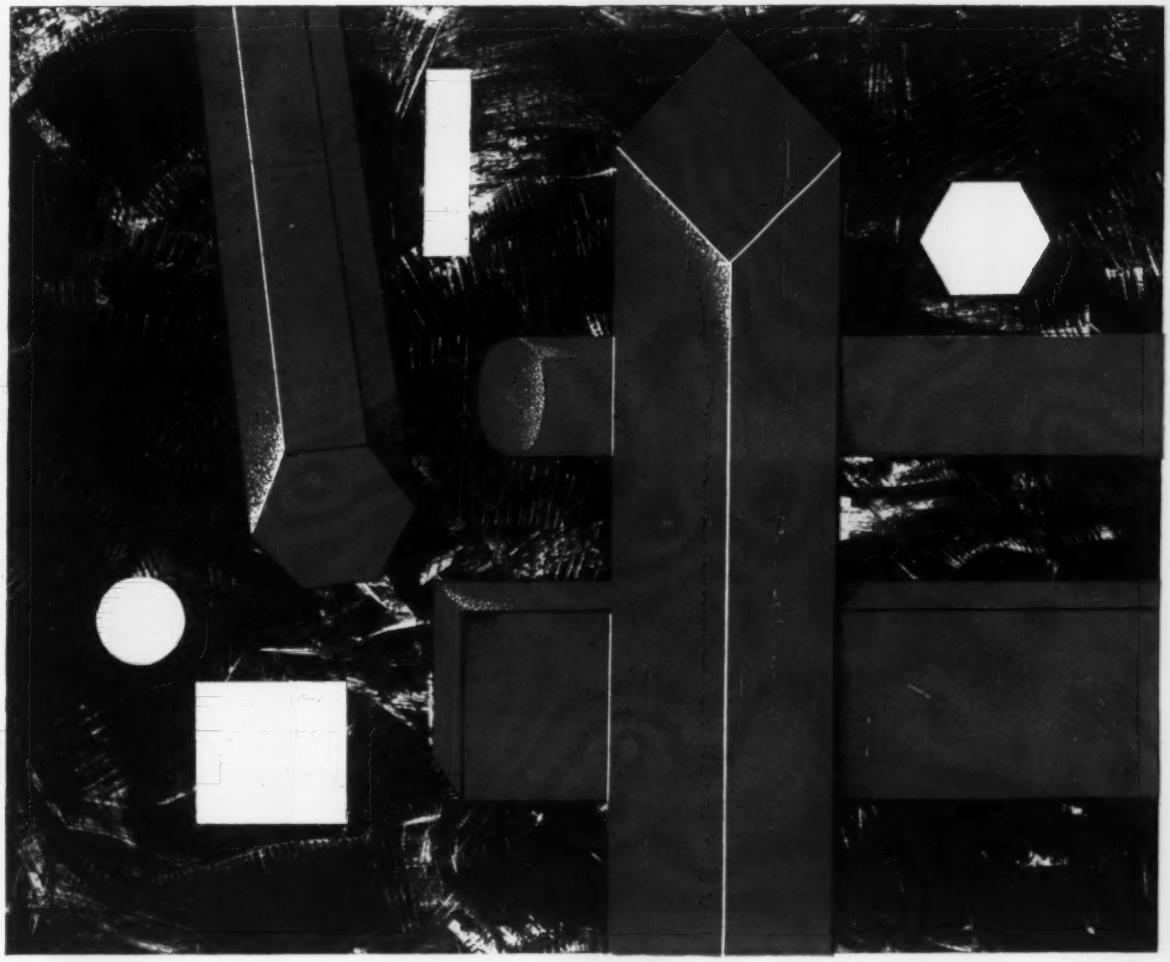
Series K four-wheel platform trucks are ideal for plant maintenance equipment, tools, and fire equipment.

Power is provided by a Willys 72-hp gasoline engine, wheelbase is 80 in., over-all length is 144 in., and width is 58 in. *Write*: Kalamazoo Mfg. Co., 2075 Reed St., Kalamazoo, Mich. *Phone*: Fireside 5-0134

Roller Removed Easily

The lightweight No. 138 conveyor roller for package and carton handling has Spring-o-matic axle construction to permit quick, easy insertion and removal of the roller from the frame.

The conveyor sections are in 12



Use quality USS Bars

...available at your local steel service center

USS Bars are instantly available at your nearby steel service center, thanks to United States Steel's well-organized, wide-range system of product distribution.

By dealing with a steel service center, you can combine the profit-making advantages of a steel service center with the fine, quality-controlled products of United States Steel. For instance, you can order USS Bars in various types, sizes, grades and finishes —including rounds, squares, flats, hexagons, angles and channels.

Remember, as a part of the American Steel Warehouse Association, your steel service center has been set up specifically to handle your immediate steel demands. So the next time you order bars from your steel service center, be sure to specify *USS Bars.*

USS is a registered trademark

USS United States Steel

AMERICAN STEEL WAREHOUSE ASS'N.

ROLOCK

FABRICATED ALLOYS

HEAT AND CORROSION RESISTANT

BIG maintenance savings

BIG furnace covers

These heavy 309-S Stainless covers are literally "big as a house"... about 20′ x 8′ x 4′. Previous designs were the best available, but the customer told us it took a skilled welder at least one shift a week to keep the seven covers in service. Use of Rolock's unique "corrugated" construction, with provision for proper expansion and contraction in service, essentially eliminates all of this maintenance.

This is just one more example of the improved performance and substantial savings credited to Rolock's engineering approach to tough fabrication problems, when coordinated with our extensive modern plant facilities and specialized skills in high heat-resistant alloy fabrication.

Today, Rolock is producing a wide range of important equipment in the fields of furnace hoods, covers and bells, pit-type furnace retorts and equipment, vacuum retorts, pressure and vacuum vessels, in addition to standard equipment fabricated in the high heat-resistant alloys.

Let us submit recommendations and quote on your next tough job. General Catalog G-10A will be sent on request.

SALES AND SERVICE REPRESENTATIVES FROM COAST TO COAST

ROLOCK INC., 1262 KINGS HIGHWAY, FAIRFIELD, CONN.

JOB-ENGINEERED for better work
Easier Operation, Lower Cost

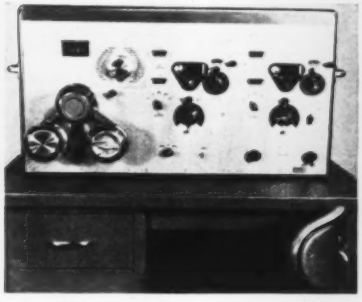
2RL58

and 18 in. widths from stock, and the roller, which turns on an integral ball bearing, is 1⅜ in. in diameter, has an 18-gage steel wall, and is rated at 80-lb capacity. *Write*: E. W. Buschman Co., Clifton and Spring Grove Avenues, Cincinnati 32, Ohio. *Phone:* Mulberry 1-1600

System Controls Tools

The Factrol analog system is a continuous path magnetic system for controlling motions and auxiliary functions of machine tools and other motion control processes.

You have a choice of complete service, the controls, servomechanism equipment, brackets to mount, and



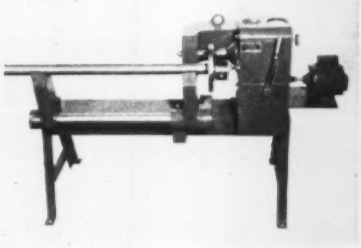
supervision of installation on present machine tools—or a packaged control unit.

Illustrated is a mechanical analog recorder for transferring the tool path from a part drawing onto magnetic tape. *Write*: Tracer Control Co., Hazel Park, Mich. *Phone*: Jordan 4-6525

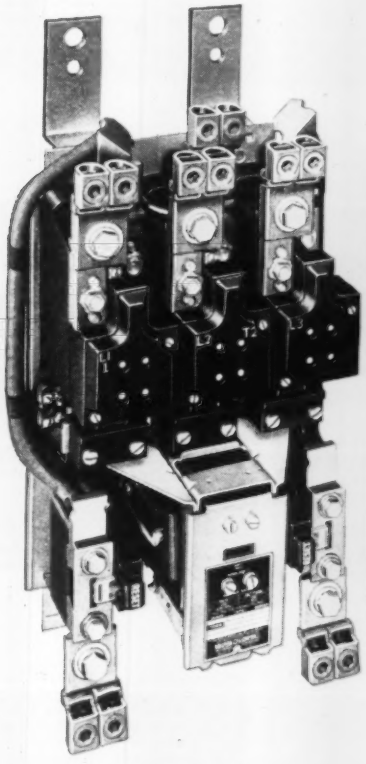
Long Shaft Flanges Tested

A Brinell testing machine for production testing of flange members on long shafts is hydraulically powered.

It has two dials—one shows load applied in kilograms; the other is a



NEW



SQUARE D
Vertical Action
SIZE 5 STARTER

Smaller! REQUIRES ONLY
270 SQUARE INCHES OF SPACE

DESIGN LEADERSHIP FEATURES IN SQUARE D's
COMPLETE LINE OF VERTICAL ACTION STARTERS—SIZE 0 through 5

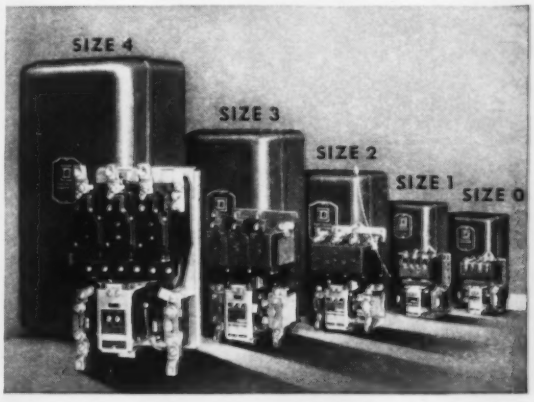
What's most important in a motor starter?

Performance and **long life** come first, naturally—and Square D's straight line guided motion and heavy-duty silver alloy contacts assure both. But that's only the beginning—

Fast wiring is important, too. Square D gives you a lot of wiring space and time-saving solderless terminals.

Easy maintenance rates high. The coils, contacts and overload relays on all Square D starters can be changed in a jiffy... without disturbing external connections. A screwdriver is all you need. And—

"Off-the-Shelf" Parts Kits make normal maintenance and "on-the-job" modifications easier than ever. Packaged parts include interlocks, contacts, coils, overload relays, pushbuttons and selector switches. They're easy to buy, easy to identify and faster to install.

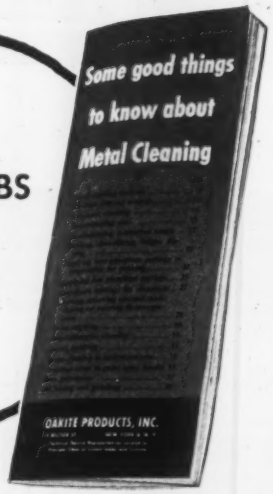


For the complete story, write for Bulletin 8536
Square D Company, 4041 N. Richards St., Milwaukee, 12, Wis.

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE

SQUARE D COMPANY

WHICH METAL-CLEANING JOBS WOULD YOU LIKE TO IMPROVE?



¶ Are you cleaning metal in the most economical way? *See page 9 of Oakite's FREE booklet on Metal Cleaning.*

¶ Are you cleaning metal the fastest way? *See page 12.*

¶ Do you need room-temperature cleaning combined in one operation with temporary rustproofing? *See pages 12 and 14.*

¶ Do you know the advantages of alkaline pickling? *See page 21.*

¶ Have you compared the values of iron phosphate coating and zinc phosphate coating in preparation for painting? *See pages 22 and 25.*

¶ Can you use a cleaner that removes rust and oil at the same time; often eliminating all need for pickling? *See page 30.*

¶ Do you have trouble stripping epoxy resins, pigment residues, phosphate coatings and under-paint rust? *See page 31.*

¶ How do you clean parts that are too large to be soaked in tanks or sprayed in machines? *See page 31.*

¶ Are you getting full profit out of your finishing barrels? *See page 32.*

¶ What do you do when oversprayed paint neither floats nor sinks in your paint spray booth wash water? *See page 35.*

¶ Do you need better protection against rusting in process or in storage? *See page 37.*

FREE For your copy of "*Some good things to know about Metal Cleaning*" write to Oakite Products, Inc., 34E Rector Street, New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE®
MATERIALS · METHODS · SERVICE
SCIENCE

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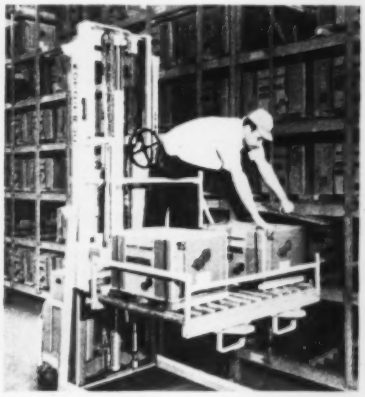
NEW PRODUCTS and equipment

direct reading dial for comparative checking that uses handset indicating needles. The anvil and testing ball may be interchanged to allow tests to be made on either side of the work. *Write*: Detroit Testing Machine Co., 9390 Grinnell Ave., Detroit 13, Mich. *Phone*: Warwick 1-0659

Truck Operated from Forks

A Hi-Rider truck control system permits the operator to control steering, lift, and travel from a position on the load forks.



The system applied to a standard outrigger-type truck is shown. It may be applied to any standard, high lift-type Moto-Truc. *Write*: Moto-Truc Co., 1959 E. 59th St., Cleveland 3, Ohio. *Phone*: Utah 1-9595

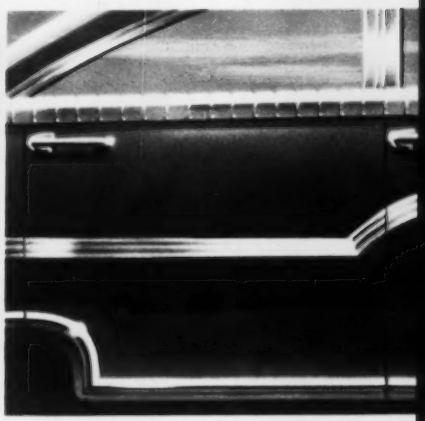
Device Speeds Analysis

The X-ray Spectrograph saves hours in analyzing complex mixtures of chromium, nickel, molybdenum, tungsten, columbium, manganese, and cobalt alloys.

Write: Philips Electronics Inc., 750 S. Fulton Ave., Mt. Vernon, N. Y. *Phone*: 4-4500

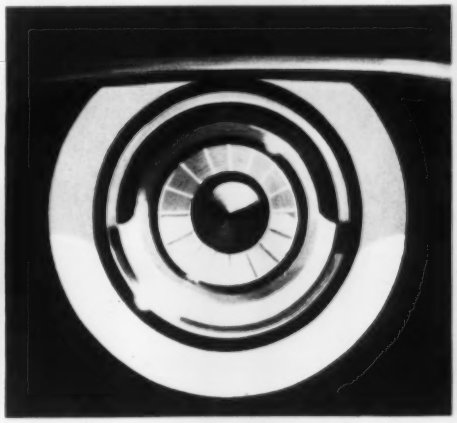
On CARS, too... "handsome is as handsome does"...

here's how beautiful Stainless Steel does a car-saving job for you



stainless moulding protects body paint from rubs and scrapes

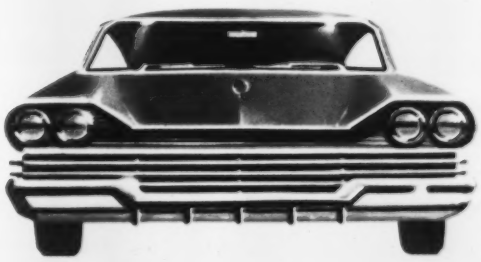
stainless trim makes weatherproofing permanently attractive



stainless wheel covers resist abrasion, stones and road chemicals

stainless provides solid protection for easily-marred decorative panels

and... stainless brightens the entire car for life!

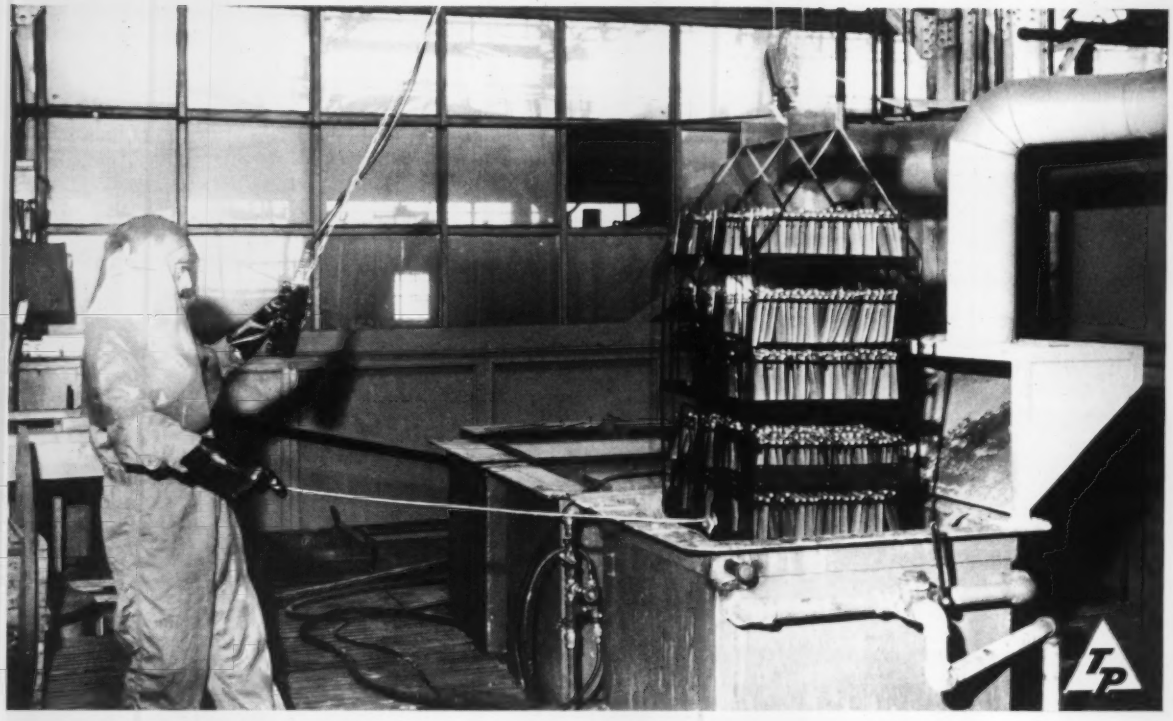


Superior Stainless Strip Steel

Superior Steel

Division of

CARNEGIE, PENNSYLVANIA



How Thompson Products saves $9,750 a month descaling titanium parts in hot Virgo bath

In this plant of Thompson Products, Inc., titanium forgings become mirror-smooth blades for aircraft turbines. But first, workers must get rid of the tough black oxide scale that forms on the parts during forging and heat treating.

They used to *blast* scale loose with a special zirconium sand imported from half-way around the world. But the sand was expensive—$10,000 a month. It had to be purchased and stored 4½ carloads at a time. Stacked in bags, it ate up valuable space—and made a mess when heavy bags burst.

Then this company called in a Hooker sales-service man who showed how they could get the scale off *chemically*. He recommended Virgo Descaling Salt at a cost of only *$250 per month* instead of $10,000 for sand.

Parts come clean in 4 dips

Now titanium parts ride in stainless-steel baskets through four dip tanks—and come out with not a trace of scale. In five minutes in the first tank, molten Virgo salt at 850°F removes almost all of the stubborn scale. In successive dips, cold water removes the adhering molten salt, acid quickly removes the residual soft oxide and hot water rinses the parts clean.

The process descales stainless steel and other high-temperature alloys, too—simply by raising temperature of the salt another 100 degrees. There's no attack on the metal itself at any stage.

It's easier now for inspectors to see tiny defects in the smooth, chemically clean surface of these parts; so quality control is better than before.

Maintenance costs are lower, too: just four dip tanks that need occasional replenishing with salt and acid.

Have you a tough scale problem? Perhaps a talk with a Hooker representative will open a way to substantial cost reductions for you. If you'd like to discover how, just drop us a note on your business letterhead.

HOOKER CHEMICAL CORPORATION
1207 Union Street, Niagara Falls, N. Y.

HOOKER CHEMICALS PLASTICS

DUREZ® PLASTICS DIVISION • NORTH TONAWANDA N.Y.
NIALK® CHEMICALS • NIAGARA FALLS, N. Y.
OLDBURY® CHEMICALS • NIAGARA FALLS, N.Y.

Sales Offices: Chicago, Ill.; Los Angeles, Calif.; New York, N. Y.; Niagara Falls, N. Y.; Philadelphia, Pa.; Tacoma, Wash.; Worcester, Mass. *In Canada:* Hooker Chemicals Limited, North Vancouver, B. C.

NEW literature

Write directly to the company for a copy

Stainless Tubing

Technical Bulletin TB-365A explains how use of the right type of stainless mechanical tubing will result in savings to the manufacturer. Included are tolerance tables covering diameter, ovality, wall thickness, straightness, length, and machining allowances. Tubular Products Div., Babcock & Wilcox Co., Beaver Falls, Pa.

Gear Couplings

Catalog C-5 details the entire range of standard Sier-Bath flexible gear couplings. Included are sections on applications, advantages, installation, lubrication requirements, and engineering data. Sier-Bath Gear & Pump Co. Inc., 9280 Hudson Blvd., North Bergen, N. J.

Magnesium Plate

A 55-page magnesium tooling plate shop manual covers plate properties, use of extrusions in tooling, shop characteristics of alloys, machining instructions, grinding and polishing, joining, inserts and bushings, surface protection, and good shop practices. An appendix lists standard sizes. Magnesium Dept., Dow Chemical Co., Midland, Mich.

Manual Arcwelding

"Reducing Costs by Proper Care of Arc-Welding Circuits" is written in nontechnical language and points out many things that can be done to keep electric arcwelding circuits operating properly. Lenco Inc., 350 W. Adams St., Jackson, Mo.

Voltage Transformers

A 4-page bulletin describes the design and construction characteristics of heavy duty, variable voltage transformers in the 5 to 41.5 kva range. M & T Welding Products Corp., 703 37th Ave., Oakland 1, Calif.

Heavy-Duty Feedrails

Bulletin No. 70 catalogs heavy duty, trolley busway, electrical distribution systems. They are used in 225, 375, and 500 ampere systems for machine tools, conveyor assembly lines, or other moving equipment. Feedrail Corp., 125 Barclay St., New York 7, N. Y.

Automatic Sheet Feeder

A 6-page folder describes the production advantages of the 6000-lb capacity, TF-6 automatic metal sheet feeder. It will feed from 38 gage to 25 gage at speeds to 85 a minute. Dexter Co. division of Miehle-Goss-Dexter Inc., Pearl River, N. Y.

Motors Conserve Space

Bulletin SP-1 gives uses and characteristics of space-saving motors in ratings from ½ to 10 hp. They are as much as 50 per cent smaller than conventional motors of like horsepower. Motor Div., Peerless Electric Co., Warren, Ohio.

Dust Collector

Bulletin No. 581 describes a wet-type dust collector that separates the dust from the air by centrifugal and impingement action against wetted surface—without the use of sprays, moving elements, and water eliminators. Dust Suppression & Engineering Co., 120 S. Broadway, P. O. Box 67, Lake Orion, Mich.

Material Handling

Brochure AHE-609 describes clamp roll carts, work benches, portable steel racks, trucks, and other equipment for in-plant usage. Conveyor Systems Inc., 6451 Main St., Morton Grove, Ill.

Submicron Filtration

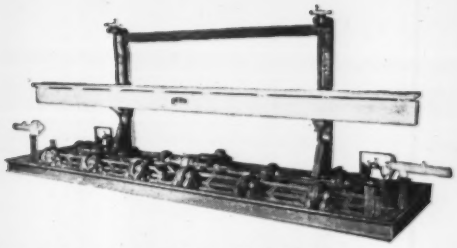
"12 Avenues to Metalworking Cost Reduction" deals with submicron filtration and its contribution to cost reduction. Alsop Engineering Corp., 58 Aster St., Milldale, Conn.

Electric Clutches

Catalog No. 6304-1A provides detailed application reference material on electri-

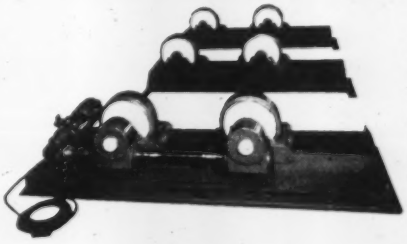
WEBB TANK PRODUCTION MACHINERY

REED TRACK SUPPORTS For Automatic Welding Head Carriages

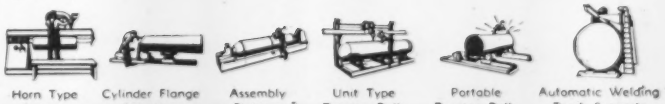


Increase production — use this fixture on 4' to 12' diameter work. Welding track is 24' to 34' long. Powered vertical adjustment is available for all models. May be used with your present turning rolls, welding positioners, special jigs for straight seam work, or portable type rolls illustrated below.

REED Portable Type TURNING ROLLS



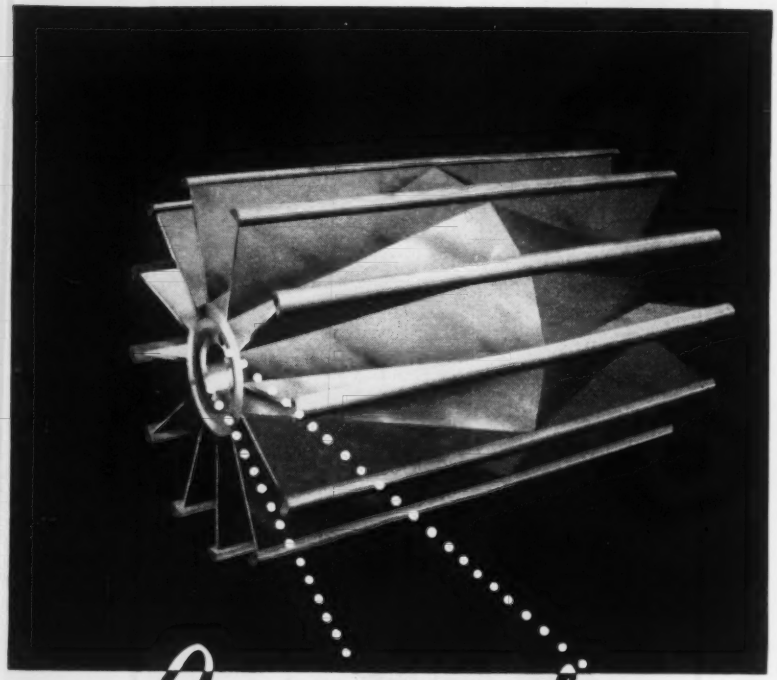
For manual or automatic welding and other operations requiring rotation of a cylindrical vessel. Capacities range from 3 tons to 75 tons; larger units built to special order. Powered by electric motor with variable speed transmission. Readily portable, they may be used free or anchored to the floor as desired.



Horn Type Fixtures | Cylinder Flange Offsetters | Assembly Fixtures | Unit Type Turning Rolls | Portable Turning Rolls | Automatic Welding Track Supports

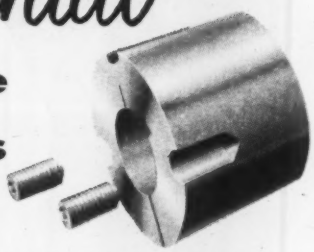
FOR ILLUSTRATED LITERATURE WRITE DEPT. D

REED EQUIPMENT DIVISION
THE WEBB CORP. WEBB CITY, MO. U. S. A.



Continental

Wing Type Pulleys with



"TAPER-LOCK"® HUBS

Welded Steel Wing Type Self-Cleaning Pulleys — now standard with "Taper-Lock" Hubs.

Self-cleaning pulleys prevent belt mis-alignment due to build-up of material on pulley face. "Taper-Lock" Hubs provide the most satisfactory type of clamp hubs at an economical price, giving the equivalent of a shrunk-on fit while permitting easy assembly and disassembly.

For further information on Welded Steel Pulleys write for Bulletin ID-134.

CGC

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ATLANTA • DALLAS • KNOXVILLE • MEMPHIS • MOBILE • NEW YORK 17

NEW LITERATURE . . .

cally operated devices for engaging and disengaging machinery gears and drives. Clutch accessories and parts are described and priced. Transformer & Rectifier Div., I-T-E Circuit Breaker Co., 1900 Hamilton St., Philadelphia 30, Pa.

Pancake Motors

Bulletin No. 2100 describes enclosed pancake motors that reduce motor length up to 60 per cent, compared with standard models. Motors are flange type of conventional radial air-gap design with formed end coils and one piece housing-bearing brackets. Louis Allis Co., Milwaukee 1, Wis.

Index Tables

Catalog No. 302 describes design characteristics of the roller gear drive indexing mechanism in Intermittor index tables and rotary transfer machines for high speed, precision assembly and manufacturing. Ferguson Machine Corp. of Indiana, 7818 Maplewood Industrial Court, St. Louis 17, Mo.

Motor-Generator Sets

Bulletin GEA-6809 includes data on ratings and dimensions of vertical high frequency motor-generator sets. General Electric Co., Schenectady 5, N. Y.

Miniature Air Cylinders

A bulletin and price list, No. MA-25, covers miniature pneumatic cylinders, valves, solenoids, manifolds, fittings, and accessories. Clippard Instrument Laboratory Inc., 7390 Colerain Rd., Cincinnati 39, Ohio.

Tool Steel

A 24-page booklet lists 4132 sizes of tool steel in 41 grades carried in warehouse stock. Vulcan-Kidd Steel Div., H. K. Porter Company Inc., Aliquippa, Pa.

Silver Joining Alloys

A silver alloy issue of Eutectic's Technical Information Digest (24 pages) provides full data for production and maintenance users of high grade silver alloys for metal joining. Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing 58, N. Y.

Borescopes

Precision borescopes ranging in size from a few inches to more than 60 ft in length are described in a folder. Included are details of the three most commonly used interchangeable viewing heads. Lenox Instrument Co., 2012 Chancellor St., Philadelphia 3, Pa.

Conveyor Troubleshooter

A pocket-sized slide card provides a quick method for locating the probable causes of conveyor troubles and lists specific cures. Conveyor Products, Mechanical Goods Div., United States Rubber Co., Passaic, N. J.

Alumina Refractories

High alumina refractories for high temperature furnaces in industry are covered in a bulletin. Detailed are characteristics,

Better Saw Blade Performance

GUARANTEED by DoALL's built-in quality!

To guarantee the quality of DoALL Saw Blades, they must pass 83 separate control checks made at every step of the way—from raw material analysis to final package inspection. DoALL Saw Blades *must* pass every known test to prove their right to carry the DoALL label—your identification of the finest in saw blades.

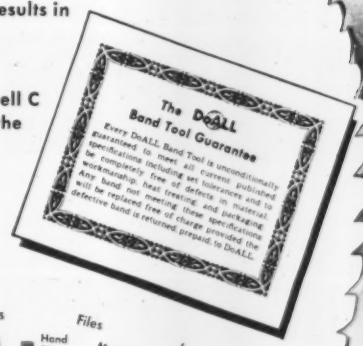
Tooth set guaranteed **within a ± .002" tolerance assures accurate sawing . . . longer cutting life . . . uniform kerf size . . . and finest surface finish.**

Sharpest, toughest, most durable teeth **are obtainable only from DoALL's modern technology and exclusive manufacturing processes.**

Shape-engineered gullets **assure smooth, uniform chip flow at faster cutting speeds. Gullet design, developed after photoelastic stress analysis, results in increased tooth strength and greater flex life.**

Controlled tooth hardness **is 61 to 63 Rockwell C for longest cutting life. Uniform tempering of the flexible back insures maximum flex life.**

DoALL makes 18 types of band tools in more than 300 width-pitch-set combinations. Ask for the DoALL Saw Blade Selector Chart. It's free!



IN STOCK

AT YOUR LOCAL DoALL STORE

THE DoALL COMPANY
DES PLAINES, ILLINOIS

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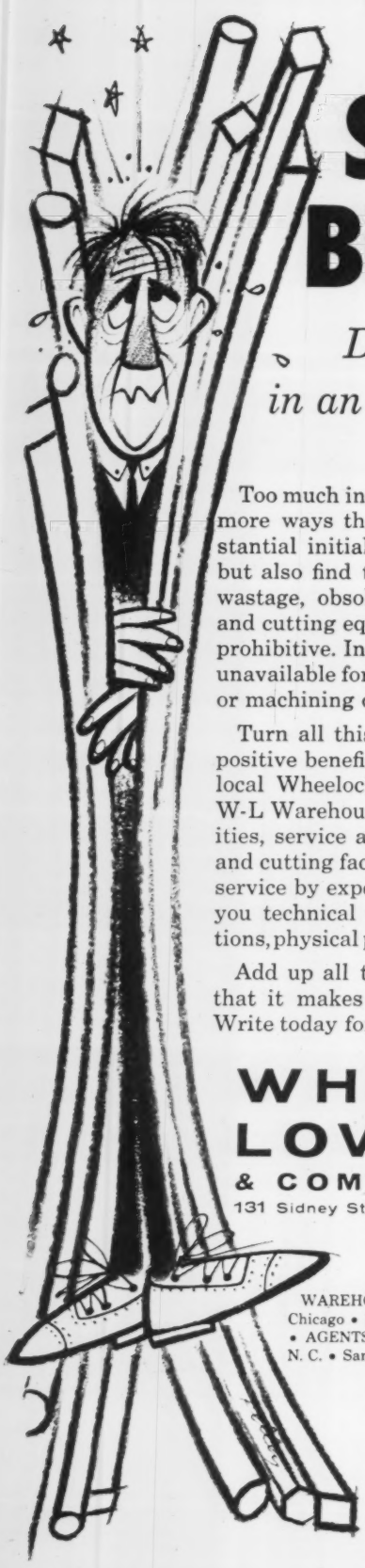

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NEW LITERATURE . . .

properties, and uses. Walsh Refractories Corp., 101 Ferry St., St. Louis 7, Mo.

Powdered Aluminum Alloys

A technical data sheet describes physical and chemical properties of several atomized aluminum alloys. Aluminum-iron, aluminum-silicon, and aluminum-magnesium are listed. Hummel Chemical Co. Inc., 90 West St., New York 6, N. Y.

Mechanical Presses

Single point, eccentric gear presses in capacities from 100 to 1800 tons are featured in an 8-page bulletin. Federal Machine & Welder Co., Warren, Ohio.

Platinum Plating

A technical bulletin describes the low stress and ductility of the Platanex industrial platinum plating process. Platinum electroplate is produced continuously directly from the bath. Precious Metals Div., Sel-Rex Corp., Nutley, N. J.

Stainless Steel

A pocket price book for stainless steel provides a schedule of quantity surcharges so that the purchaser may determine the most economical shipments for his needs. Chase Brass & Copper Co., Waterbury 20, Conn.

Chilling and Testing

Many industrial operations performed by chilling equipment and test chambers are described in a 12-page catalog. Separate charts are provided for high speed, moly steel processing, as well as steel chill treating for complete stabilization. Cincinnati Sub-Zero Products, Reading Road at Paddock, Cincinnati 29, Ohio.

Induction Heating

Folder DM-74 describes a 400-cycle induction heating generator and tells how it simplifies the preheating and stress relieving of arcwelded joints. Hobart Bros. Co., Troy, Ohio.

Conveyor Systems

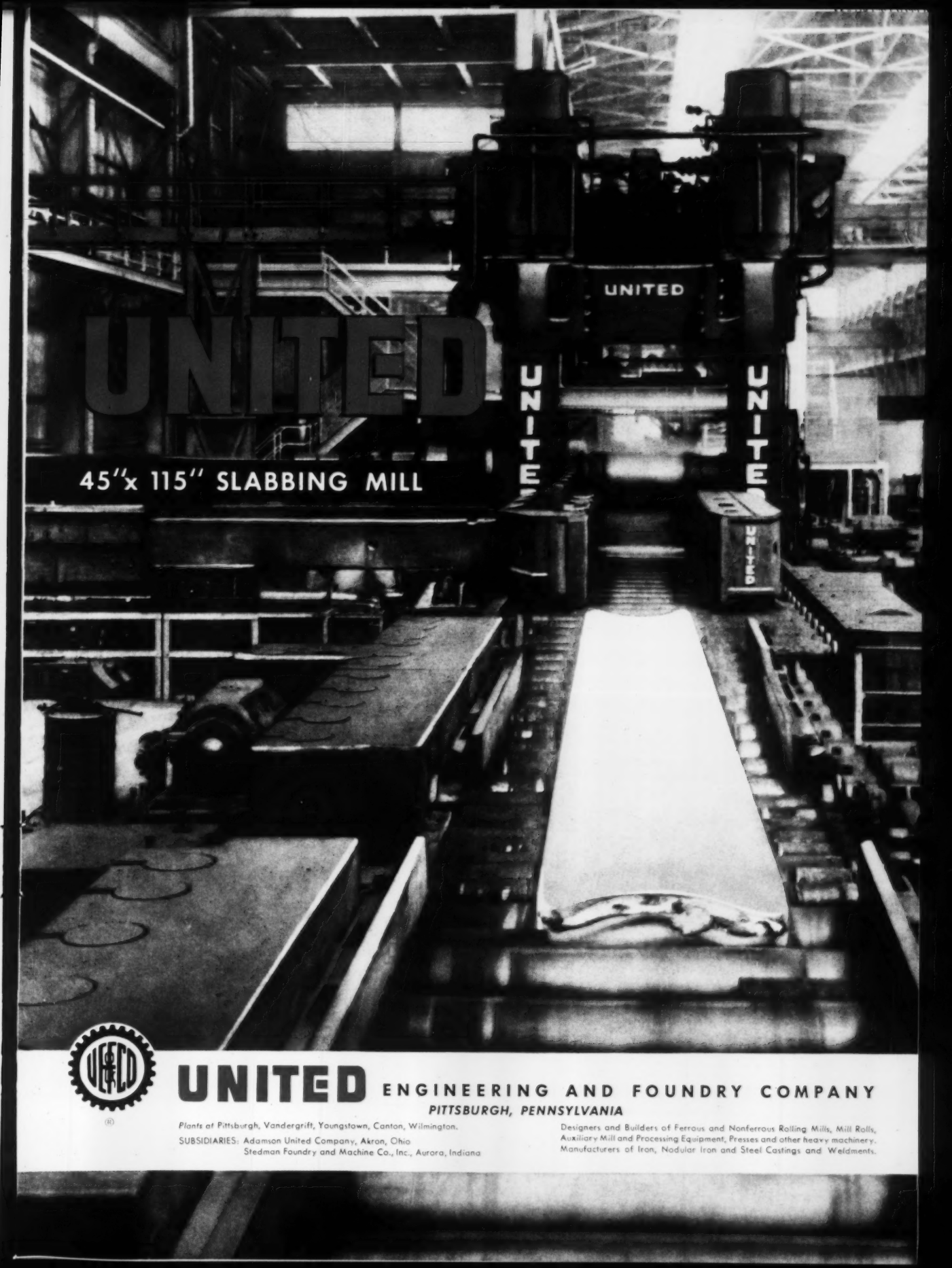
Catalog 80 describes the complete line of Buschman L-M horizontal and inclined belt conveyors. It details how they can be customized to meet the exact requirements of any factory or warehouse for a light-medium conveyor system. E. W. Buschman Co., Clifton and Spring Grove Avenue, Cincinnati 32, Ohio.

Titanium Arcwelding

"Recommendations for Arc Welding Titanium" provides comprehensive information on this subject for fabricators employing or contemplating the use of titanium. Mallory-Sharon Metals Corp., Niles, Ohio.

Phosphate Ester Fluid

A data sheet on Houghto-Safe 1010 provides material on the physical properties of this fire-resistant product. Fluid is suitable for use in hydraulic-actuated control systems, and in applications with high and low temperatures. E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.



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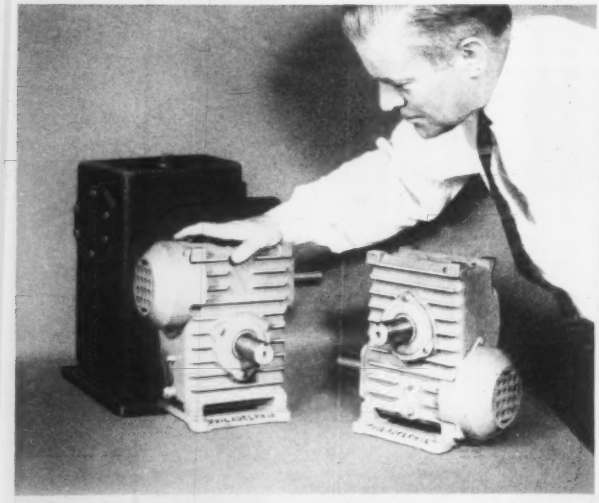

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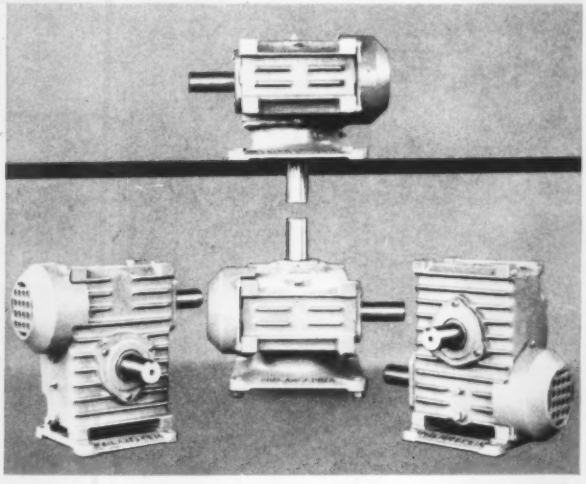

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Market Outlook

Higher Costs Worry Steelmakers

THIRD QUARTER reports of several steelmakers will be written in red ink if the industry delays raising prices until the market outlook improves.

Demand for steel won't pick up markedly before September, when inventory reductions will have run their course and automakers will be turning out '59 models. If nothing is done until then to compensate steel producers for the higher costs they incurred on July 1, several companies will be in trouble. No amount of cost cutting will save them from deficit operations.

Ironically, the company most observers think will lead the parade to higher prices is the one that can best afford to stand pat. U. S. Steel Corp. earned 7.8 cents on its sales dollar during the first quarter (industry average: 5 cents), did as well or better during the second quarter. Its break-even point is undoubtedly one of the lowest of major producers.

WHY U. S. STEEL DELAYS— The fundamental reason for U. S. Steel's "wait and see" attitude is that business conditions aren't right for an increase. By all that's logical, prices should fall during a period of slack demand. If they're advanced while Congress is in session, Sen. Estes Kefauver (D., Tenn.) will make even more trouble than he does during a recess. Another Kefauver attack wouldn't endear Big Steel to the public or assist underwriters in their task of selling the corporation's debentures.

FABRICATORS ON THE SPOT— Much as they need higher prices, steelmakers hesitate to raise them at the expense of fabricators. They're well aware that manufacturers of capital equipment, construction machinery, consumer durables, and components won't be able to pass all or even most of the higher costs along. Competitive conditions will force many fabricators to absorb as much as $6 a ton (see Page 61), eliminating profits in some cases.

ALAN WOOD RETREATS— Alan Wood Steel Co. rescinded its price hike of $5 to $7 a ton. Said Harleston Wood, president: "We are disappointed that the big mills have not increased their prices." If prices aren't advanced by mid-September, a lot of steelmakers will be disappointed.

Look for one of the big mills to act by that time if U. S. Steel doesn't.

NO MORE HEDGING?— "Our customers are surprised that we haven't raised our prices," a sheet sales executive reports, "but I don't think we'll have another round of hedge buying. Last month, consumers had a notion that prices were going up on July 1, so they had something to shoot at. Now they don't know what to think. If they ordered today, they'd have no assurance that prices wouldn't be hiked before shipment."

AUTOMAKERS ORDERING— Reports from Pittsburgh and Detroit indicate that automakers are anxious to get started with their '59 models. At Pittsburgh, Chevrolet's stamping plant is asking its suppliers to deliver sheets two weeks ahead of schedule. At Detroit, Chrysler Corp. is ordering bars for late August delivery. (They'll be used in suspension systems, unchanged for 1959.) General Motors Corp. and Ford Motor Co. are ordering stainless for delivery in late August and early September. Long leadtimes suggest that the car builders want to protect themselves against a possible fall rush.

PRODUCTION REBOUNDS— Steel production rose to an estimated 1,445,000 tons (53.5 per cent of capacity) last week from an actual output of 1,376,000 tons in the preceding holiday period.

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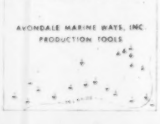

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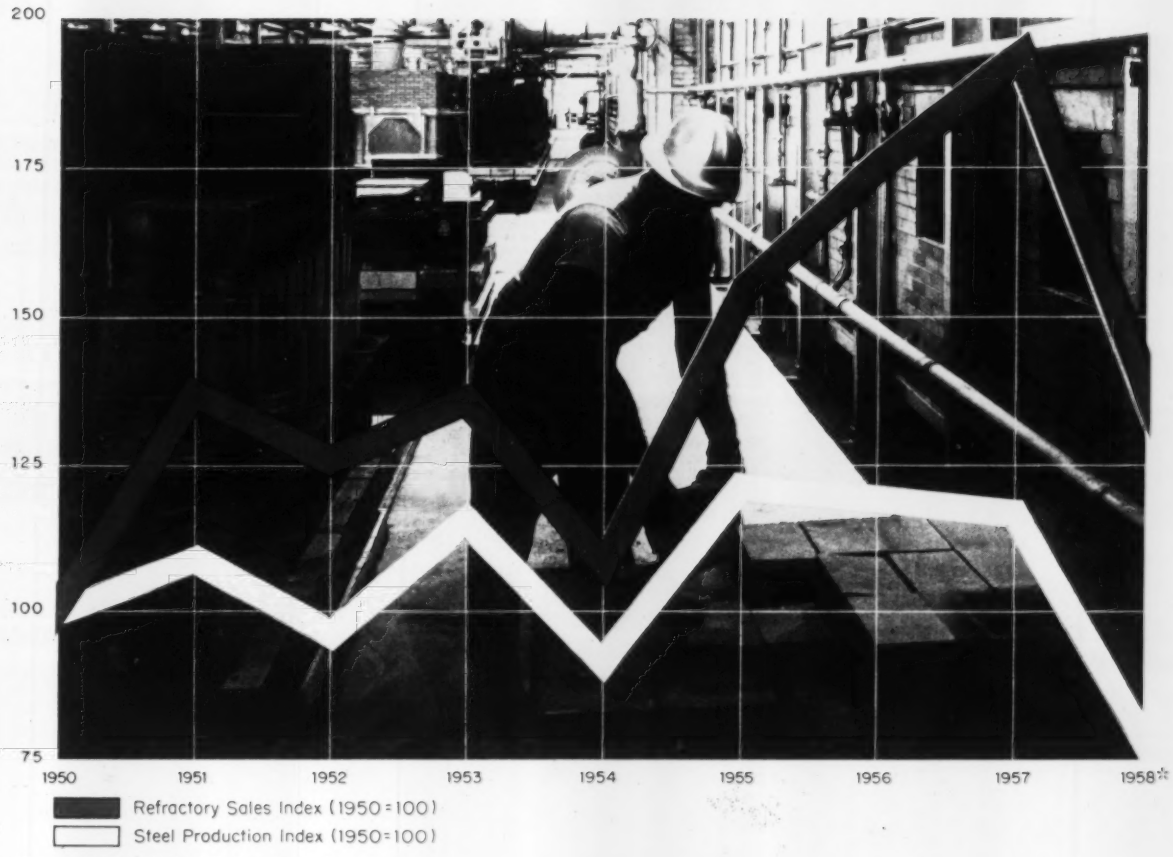

Refractory Sales Outpace Steel

Greater demand for premium quality product holds dollar volume up despite lag in primary metal output. Gains in ingot rate should boost sales in last half of 1958

REFRACTORY sales prospects are brightening. Unit sales should rise with steel output the rest of this year. Refractory producers derive greater pleasure from long term trends which cause their dollar volume to rise faster than steel production.

As the chart shows, refractory dollar volume closely followed steel production from 1950 to 1955. In the past two years, however, falling operations failed to stop the uptrend in refractory volume. Between 1956 and 1957, steel production dipped from 115.2 million to 112.7 million tons. Refractory sales soared from $418.7 million to $461.4 million last year.

Sales managers aren't predicting a new record this year (dollar volume totaled $80 million in the first quarter), but they are looking for sales gains from now until yearend. Here's why:

1. Steelmakers used up their plant stocks of refractories early this year, while cutting their orders. Refractory manufacturers think such stocks are as low as they can go. If steel operations improve, as expected, brick sales should gain immediately. Illinois Clay Products Co., Joliet, Ill., reported its sales went up right after steel production in the Chicago area rose last month. Corhart Refractories Co. Inc., Louisville, says customers have lowered stocks so much that steelmakers' demand picks up instantly with every increase in the operating rate.

2. Use of refractories by several industries other than steel is expected to remain firm. Examples: Cement and bottling glass producers, and the chemical industry. They're taking large tonnages. Babcock & Wilcox Co., New York, says demand is also growing for insulating bricks used in marine boilers.

3. The trend to greater use of premium quality products by metal producers will boost refractory dollar volume further in the second half of the year. "The tendency is for industry generally to purchase refractories of higher grades," explains

W. F. Godejohn, vice president, Refractories Div., Gladding, McBean & Co., Los Angeles. Reason: They provide longer service life in critical furnace areas.

Forecasts Differ Slightly—Corhart thinks demand will snap out of the midsummer doldrums as early as Sept. 1. Armstrong Cork Co., Lancaster, Pa., looks for sales gains by the end of the third quarter. Botfield Refractories Co., Philadelphia, thinks steelmakers' purchases will improve in late August or early September.

Dollar volume may gain more rapidly than unit volume. Producers point out that each wage boost increases expense of maintenance, making furnace repairs more costly to plant managers. Steelmakers are shopping for, and buying, refractories which will help avoid the advancing costs of downtime, even if these products cost more than initial cost of standard bricks.

New Products Set Pace—"We're selling many refractories that we didn't have in our product line ten years ago, and those that aren't new are significantly improved," adds the sales manager of a major Pennsylvania manufacturer. "We look for greatest growth in refractory specialties, high alumina and zirconia."

Development of new products shows no sign of slowing. "In the future, there will be a demand for new materials such as oxides, borides, nitrides, and silicides to satisfy requirements of applications that only a few years ago did not exist and for which other materials are inadequate," says J. M. Smith, manager of marketing, Refractories Div., Carborundum Co., Perth Amboy, N. J.

"We've found new uses for plastic and ramming types. Biggest advances are in high alumina ramming mix. Sales have not dropped as much as the steel operating rate, and we're looking for gains this fall," add sales executives at Plibrico Co., Chicago.

Further impetus to product development comes from rocketwork. Early this year, Harbison-Walker Refractories Co., Pittsburgh, announced that its Extra Strength Castable served in a rocket-launching pad at Cape Canaveral, Fla.

Trends Lead to Expansion—Refractory producers must grow to meet their customers' changing requirements although operations are well below capacity. For example, North American Refractories Co., Cleveland, opened a research laboratory in Curwensville, Pa., early this year. It will develop new products while improving existing ones. That firm also opened a plant at Farber, Mo., partially to fill a growing demand for one of the newer products —high fired, superduty bricks. (It offers improved physical properties in blast furnaces.)

Globe Brick Co., East Liverpool, Ohio, is completing a pilot plant for research and development at Newell, W. Va.

Basic Inc., Cleveland, will make additions to ore dressing facilities at Gabbs, Nev., to improve the quality of magnesite used in many of the firm's refractories.

Walsh Refractories Corp., St. Louis, is adding to facilities in that city for production of blast furnace refractories. Completion of this expansion is set for late this year, the company reports.

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Tool Steel . . .

Tool Steel Prices, Page 169

Shipments of high speed and tool steel (excluding hollow drill steel) totaled 5560 net tons in May after deducting 74 tons for shipments to members of the industry for conversion or resale, reports the American Iron & Steel Institute. In the preceding month, the net movement was 5679 tons. In May a year ago, it was 10,244.

Cumulative shipments in the first five months this year were 29,195 net tons. This compares with 48,094 in the like period of 1957.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 166 & 167

Sheetmakers don't expect much market activity this month, but volume promises to be heavier than seemed likely a couple weeks back. Generally, the mills will ship less tonnage than they did in June, chiefly because of manufacturing plant vacations.

While buying will probably be the slowest for any month so far this year, diversified inquiry hints of more active demand than suppliers anticipated. The decline from June hedge buying will not be too severe.

Little Hedge Buying—Not much additional hedging is thought likely, though most consumers were surprised when prices didn't go up July 1. Now they don't know what to expect on prices, though the general feeling is advances will come later in the summer or in the early fall. In any case, recent hedge buying was heaviest in galvanized sheets.

In connection with prices, Alan Wood Steel Co., Conshohocken, Pa., last week rescinded the average increase of $6 a ton on its products which it made effective July 7. Maintaining the increase had hinged on similar action by other producers Alan Wood explains its backtracking by stating it had to remain competitive.

Await Auto Orders—Detroit steelmen think the auto builders will begin placing September delivery orders by the end of July—early August at latest. Significantly, though, with the exception of stainless steel producers, Detroit area mill management thinks orders will be on the cautious side as the car manufacturers feel their way into 1959 model production.

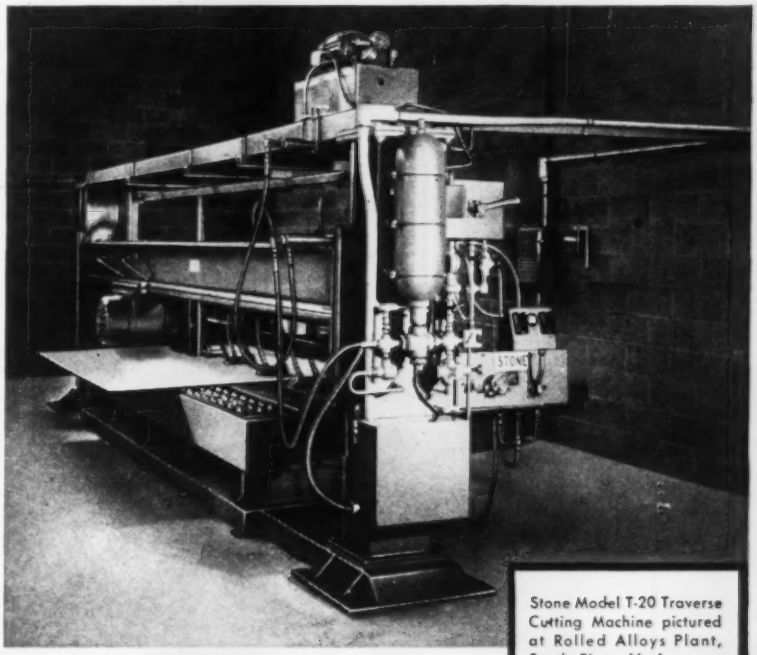
Meanwhile, a rash of spot automotive sheet orders is noted as the car builders run off 1958 repair and replacement parts to stock distribution and service centers. One Detroit producer thinks July shipments may top those in June by 10 to 15 per cent.

Quick Deliveries Offered—Leading sellers are offering about four weeks' delivery on cold-rolled sheets, and two to three weeks on hot sheets.

Inland Steel's rolling schedule shows the following deliveries: Universal mill plates, one to two weeks; safety plates, 76-in. and 100-in. mill plates, and hot-rolled sheets and strip, two to three weeks; cold-rolled sheets and strip, enameling sheets and electrical sheets, three to four weeks; galvanized sheets, from mid-August to late August; tin plate, black plate, and blue plate, August; rail steel bars, two to four weeks.

Kaiser Steel has completed instal-

2⅔ FEET PER MINUTE Through 1″ STAINLESS!



Stone Model T-20 Traverse Cutting Machine pictured at Rolled Alloys Plant, South River, N. J.

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lation of an 86-in. hot strip mill at its Fontana, Calif., works.

Plates . . .

Plate Prices, Page 165

While a moderate amount of new work is developing, plate mills have no difficulty meeting consumers' requirements. They could handle much more tonnage than they are booking.

Sheared plate mills can make deliveries within three to four weeks —in some cases in less time.

Principal weakness appears to be in railroad equipment demand, but tankwork also is off, and there is less pressure for tonnage from the shipbuilders. Ship specifications, though, are still fairly brisk and new work is in prospect with Bethlehem Steel's Sparrows Point yard low on four cargo vessels for Lykes Bros. Steamship Co. Oil and gas requirements also are fair, but they are down from a year ago.

Slower demand for plate specialties reflects the drop in capital expenditures for chemical plant, paper mill, and textile mill equipment.

Consumers served by Pittsburgh mills are making no effort to hedge against a possible summer price increase. They bought heavily last month. Plant vacations are reducing consumption this month and warehouse buying is slow. Requirements on agricultural and export account are relatively strong.

Steel Bars . . .

Bar Prices, Page 165

The outlook for steel bar sales appears brighter, though current business is as slow as at any time in recent months in some areas.

In the East, for example, not only are requirements light, but consumers hold extra tonnage as the result of June price-hedge buying. Apart from this hedge tonnage, some consumers, including fastener manufacturers and cold finishers, have had substantial stocks for months.

At the same time, sales have picked up in the Detroit area. Suppliers are finishing out service runs. Chrysler Corp. is placing bar orders for its 1959 model suspension system. Other car builders, though, are out of the market and probably will not start buying for several weeks.

Barmakers, nevertheless, say it

looks like the dearth of business is over at Detroit. One district mill says its July orders and shipments will be double those in June.

Great Lakes Steel Corp. is reported to be rolling bars again. Out-district producers will meet the competition by absorbing freight.

Inland Steel Co., Chicago, has booked 1000 tons of hot-rolled bars (1¾ in. square) for remelting from Watertown, Mass., Arsenal. Shell contracts are reviving defense requirements in New England.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 165

Demand for reinforcing steel is fairly strong. Fabricators have a good volume of inquiries before them. Competition, though, is keen and prices have been forced down to a point where the profit margin is thin. For that reason, some fabricators are passing up jobs that in other circumstances would be considered attractive.

In New England and the East, reinforcing bars account for the major share of bar mill schedules.

Tubular Goods . . .

Tubular Goods Prices, Page 169

July tubular goods order volume may be down because of June hedging, but sellers do not think the drop will be too severe.

Commercial construction and home building are spurring demand for standard pipe. One Pittsburgh mill's June bookings were so large it had to close its books early and turn away a flood of inquiries.

Makers of line pipe have little to cheer about. Gas transmission companies are sending in normal inquiries for replacement of old lines, but they're marking time on new projects until the Supreme Court reviews the Memphis decision.

Consolidated Western Steel Div., U. S. Steel Corp., resumes operations at its large-diameter pipe mill near the Geneva, Utah, plant on Aug. 4.

Stainless Steel . . .

Stainless Steel Prices, Page 169

Stainless steel orders of one Detroit area mill are expected to rise 30 to 40 per cent this month, compared with June tonnage. Shipments,

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though, will probably not equal June volume, and may be slightly smaller.

Another Detroit mill claims the auto companies have indicated they will start placing sizable orders in the last two weeks of July for delivery in August and September. This means the auto builders will be buying September needs a good two weeks before they had been expected to enter the market.

Consumption of stainless steel is picking up in the construction industry as more housing starts call for specialty stainless items. Building needs were fair all through the second quarter and should continue at a steady pace this quarter.

Exotic Compounds Priced

Release of a price list for over 60 exotic metallic compounds is announced by American Electro Metal Div., Firth Sterling Inc., Pittsburgh. The materials, available from its Yonkers, N. Y., laboratory, include borides, carbides, nitrides, silicides, and intermediate rare earth compounds. In powder form, they range in price from $60 a pound for zirconium diboride (ZrB_2) to $2850 a pound for europium disilicide ($EuSi_2$).

The materials have a wide range of uses in applications requiring resistance to high temperatures, corrosion, wear, and erosion. They stem from extensive research in developing materials for advanced design engineering, particularly in the aircraft, chemical, electronic, missile, nuclear, petroleum, and rocket fields.

Structural Shapes . . .

Structural Shape Prices, Page 165

Structural activity continues to be outstanding in the steel market. Industrial and commercial construction remain spotty, but there is considerable bridge construction and miscellaneous public work.

Public work, notably bridges, is the principal market support in the East. Several sizable jobs have been placed and others are on the point of being awarded. Most bridgework is going to the larger shops, but the small plants have enough work on hand to keep them moderately busy.

Prices for fabricated and erected structurals are not reflecting prospective advances on plain material. Competition is a major factor, showing up in a larger number of estimators per contract, with more shops bidding on work beyond their normal operating areas. Most tonnage is placed on a price basis, invariably under original estimates by engineers.

The *M. S. Suderholm* recently unloaded 525 tons of Italian steel at Buffalo. It was consigned to the New York State Power Authority in Niagara Falls, N. Y., for transmission line towers. The steel was fabricated by Societa Anonima Elettrificazione, Milan, Italy, which was the low bidder. The same company also has provided some steel for the St. Lawrence power project.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

13,000 tons, Bronx approach, Throggs Neck Bridge, Triborough Bridge & Tunnel Authority, New York, to Harris Structural Steel Co., New York.

10,400 tons, Queens approach, Throggs Neck Bridge, Triborough Bridge & Tunnel Authority, New York, to Bethlehem Steel Co., Bethlehem, Pa.

6000 tons, highway bridges, including 11-span viaduct, first section, Worcester Expressway, Worcester, Mass., to Ingalls Iron Works, Birmingham; Consolidated Building Corp., North Attleboro, Mass., general contractor.

3550 tons, superstructure, Woodrow Wilson Memorial Bridge, Potomac River, Alexandria, Va.-Prince Georges County-Maryland, Contract 3A, Bureau of Public Roads, to Phoenix Bridge Co., Phoenixville, Pa., $2,897,961.78; also 515 tons, alloy structural steel and 225 tons, machinery.

3400 tons, Schuylkill Expressway, state, Philadelphia, through F. A. Canuson & Son, general contractor, that city, to Pusey & Jones, Wilmington, Del.

3000 tons, galvanized tower steel, to Maxwell Steel Co., Ft. Worth, Tex., low at $895,050, to Bonneville Power Administration.

1730 tons, state highway structures, Six-Mile Creek, Erie Thruway, Harbor Creek Township, Pennsylvania, through Braymon Construction Co., Pittsburgh, to Levinson Steel Co., Pittsburgh; 655 tons of bars also placed with Jones & McKnight, Pittsburgh.

955 tons, six grade separation structures, East Windsor-Enfield, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Arute Bros. Inc., New Britain, Conn., general contractor.

700 tons, four buildings, Dewline-Eastern extension, U. S. Engineers, Greenland, through Crow-Steers-Sheppard (representing a combination of New York contractors) to Dreier Structural Steel Co. Inc., Long Island City, N. Y.

500 tons, including reinforcing bars, office building, Berkshire Life Insurance Co., Pittsfield, Mass., to Haarmann Structural Steel Co., Holyoke, Mass. (structurals) and Mohawk Steel Co., Albany, N. Y. (reinforcing); Gilbane Building Co., Providence, R. I., general contractor.

500 tons, Du Pont Co. sales office addition, Wilmington, Del., to Bethlehem Fabricators, Bethlehem, Pa.

450 tons, 12-story apartment, 310 E. 49th St., New York, through Danal Construction Corp., general contractor, to Dreier Structural Steel Co. Inc., Long Island City, N. Y.

300 tons, plant and pump pit, Arco reactor test station, to Titan Steel Corp., Salt Lake City, Utah, low at $99,430 to the Atomic Energy Commission.

140 tons, six-story apartment, through William Harmony, Yonkers, N. Y., to Dreier Struc-

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Aronson TrocTred (T. M. Reg.) Turning Rolls for thin-walled heavy cylindrical work to 27 tons capacity. Zero to 100 IPM turning speed and Built-In Grounding.

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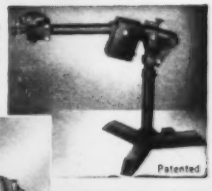

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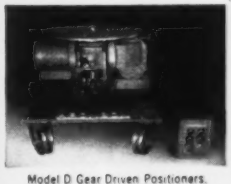
Fully Automatic Gear Driven Positioners, featuring Geared Elevation, 135° Tilting and Variable or Constant Speed Rotation. Capacities to 350,000 lbs.


Model D Gear Driven Positioners. Compact, Precise, Rugged. Capacities to 1000 lbs.

Rugged Head and Tail Stock for positioning bulky weldments between centers. Table Backup for Zero Deflection. Magnetic Braking. Capacities to 160,000 lbs. Geared Elevation Optional.

Heavy Duty Floor Turntables with precision speed control and Magnetic Braking, used for welding, burning, X-raying, etc. Capacities to 120,000 lbs., various heights and speeds.

Bench Turntable Automatic Positioners with Mercury Grounding. Capacities to 500 lbs.

Quality POSITIONERS by Aronson MACHINE COMPANY
ARCADE, NEW YORK

tural Steel Co. Inc., Long Island City, N. Y.

100 tons, Drummond Road Bridge, Sidney, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Cianchette Bros. Inc., Pittsfield, Maine, general contractor.

STRUCTURAL STEEL PENDING

4600 tons, Ft. Duquesne Bridge superstructure, state, Allegheny County, Pa.; also 515 tons of reinforcing steel; bids July 24.

4400 tons, state Cross Westchester Expressway, New York, Mt. Vernon Contracting Co., low on general contract.

4000 tons, Woodrow Wilson Memorial Bridge, Washington, D. C., Phoenix Bridge Co., Phoenixville, Pa., reported low on fabrication contract.

2800 tons, state bridge, Buffalo; bids July 17.

2400 tons, state bridge, Westmoreland County, Pa., bids July 24; also 925 tons reinforcing steel and 620 tons highway mesh.

1860 tons, state highway bridges, North East Township, Erie County, Pa.; bids July 25; also, 985 tons of reinforcing bars and 495 tons of highway mesh.

800 tons, three state bridges, Oswego County, New York; bids July 17.

389 tons, state bridge, Route 101, Section 2-D, Morris County, New Jersey, bids July 29; 370 tons of reinforcing steel also required.

385 tons, dual rolled beam bridge, Middletown-Cromwell, Conn.; bids July 14, Hartford, Conn.; also 365 tons of steel piling.

235 tons, two-span rolled beam bridge, New Hartford, Conn.; bids July 14, Hartford, Conn.; also 355 tons of steel piling, and 85 tons of reinforcing bars.

225 tons, underpass, Philadelphia; bids July 25; also, 325 tons of reinforcing bars.

208 tons, state bridge, Route 17, Section 7-B, Bergen County, New Jersey, bids July 29.

167 tons, structural steel bearings, state viaduct crossings, Route 104, Sections 1-A and 2-A, Middlesex and Somerset Counties, New Jersey, bids July 28; 1445 tons of reinforcing steel also required.

135 tons, state bridge, Nassau County, New York; bids July 17.

100 tons, two-span rolled beam bridge, Thompson, Conn.; bids July 14, Hartford, Conn.; also 45 tons of steel piling, and 35 tons of reinforcing bars.

100 tons, Nike installations, various Alaska sites; bids in to the U. S. Engineer, Anchorage, Alaska.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2000 tons, foundation-footings, radio towers, government installation, Cutler, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; to be placed, 10,000 tons, tower structures.

785 tons, flood control project, Hoosic River, Unit 4, North Adams, Mass., to Truscon Steel Div., Republic Steel Corp., Boston; Petricca Construction Co., Pittsfield, Mass., general contractor.

655 tons, state highway structures, Six-Mile Creek, Erie Thruway, Harbor Creek Township, Pennsylvania, through Braymon Construction Co., Pittsburgh, to Jones & McKnight, that city; 1730 tons of structurals also placed with Levinson Steel Co., Pittsburgh.

500 tons, plant building, General Radio Co., West Concord, Mass., to Concrete Steel Co., Boston; Sawyer Construction Co., Burlington, Mass., general contractor.

465 tons, six grade separations, East Windsor-Enfield, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Arute Bros. Inc., New Britain, Conn., general contractor; 370 tons, highway mat reinforcement, to American Steel & Wire Div., U. S. Steel Corp., Worcester, Mass.

450 tons, state highway bridges (reinforced concrete), Providence-East Providence, R. I., to Plantations Steel Co., Providence; M. A. Gammino Construction Co., Providence, general contractor.

400 tons, bascule bridge, Westport, Mass., to Northern Steel Inc., Boston; Coleman Bros. Corp., Readville, Mass., general contractor; also 600 tons, steel piles to Bethlehem Steel Co., Bethlehem Pa.; 1400 tons, fabricated structural steel, to Groisser & Shlager Iron Works, Somerville, Mass., previously reported.

250 tons, Nike storage installations in Alaska, to Northwest Steel Rolling Mills Inc., Seattle; general contract to Patti-MacDonald Construction Co. and M. B. Contracting Co., Seattle, joint low at $1,885,286 to U. S. Engineer, Anchorage, Alaska.

215 tons, buildings, Clark University, Worcester, Mass., to Concrete Steel Co., Boston; Vappi & Co. Inc., Boston, general contractor.

210 tons, hospital at Aberdeen, Wash., to Soule Steel Co., Seattle; Cawdrey & Vemo, Seattle, general contractor.

100 tons, state highway bridges, Sidney and Livermore, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Cianchette Bros. Inc., Pittsfield, Maine, general contractor.

100 tons, building, state prison, Walpole, Mass., to Northern Steel Inc., Boston; White Construction Co., Boston, general contractor.

90 tons, Lloyd Center project, Portland, Oreg., to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

17,500 tons, Tuscarora powerplant, Lewiston, N. Y., Niagara contract N10; bids Sept. 9, New York State Power Authority, New York; also 640 tons, miscellaneous metalwork and erection, 525 tons, structural steel, and 3440 tons, gates, gate and stop log guides.

1445 tons, state viaduct crossings, Route 104, Sections 1-A and 2-A, Middlesex and Somerset Counties, New Jersey, bids July 28; 167 tons of structural steel bearing piles required.

900 tons, Blue Cross office building, Federal Street, Boston; George A. Fuller Co., Boston, general contractor.

715 tons, including 250 tons of highway mesh, state highway, New Milford, Pa., bids July 24.

515 tons, also 525 tons of highway mesh, state highway structures, Somerset-Cambria Counties, Pa.; bids July 25; also 120 tons of fabricated structural steel.

450 tons, liberal arts building, University of Massachusetts, Amherst, Mass.; White Contruction Co., Boston, general contractor.

415 tons, including structurals, regional high school, Concord-Carlisle, Mass.; bids Aug. 5, Concord, Mass.

370 tons, state bridge work, Route 101, Section 2-D, Morris County, New Jersey, bids July 29; also 389 tons of structural steel required.

250 tons, four Nike storage projects, Alaska; general contract to Peter Kiewit Sons Co., Seattle, low at $1,885,286.

225 tons, bars and mesh, state highway, Washington-Allegheny Counties, Pa.; bids July 25.

225 tons, Washington State, Tacoma undercrossing; bids to Olympia, Wash., July 22.

175 tons, Washington State road span, Pierce County; bids to Olympia, Wash., July 22.

135 tons, dual rolled beam bridge, Middletown-Cromwell, Conn.; bids July 14, Hartford, Conn.

PLATES . . .

PLATES PLACED

5280 tons, new, and 825 tons used sheet piling, government furnished; general contract for first step cofferdam construction, first major phase of John Day Dam project, Columbia River, to Morrison-Knudsen Co. Inc. and LeBoeuf-Dougherty Co., Seattle, joint low at $1,394,885 to U. S. Engineer, Walla Walla, Wash.

2900 tons, government-furnished sheet piling, second stage cofferdam construction, Ice Harbor project, Snake River; general contract to Montag, Halvorson, Austin & Associates, low at $842,185 to U. S. Engineer, Walla Walla, Wash.

40 tons, H-piling, Spokane Street Bridge, repairs, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle.

PLATES PENDING

Unstated, two 2250 bbl. each bulk storage tanks; bids to the Bureau of Public Roads, Juneau, Alaska, July 15.

PIPE . . .

CAST IRON PIPE PLACED

1055 tons, 20-in. supply pipe, Seattle district project, to Pacific States Cast Iron Pipe Co., Seattle.

250 tons, 12 and 8 in., for Bellingham, Wash., to U. S. Pipe & Foundry Co., Seattle.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

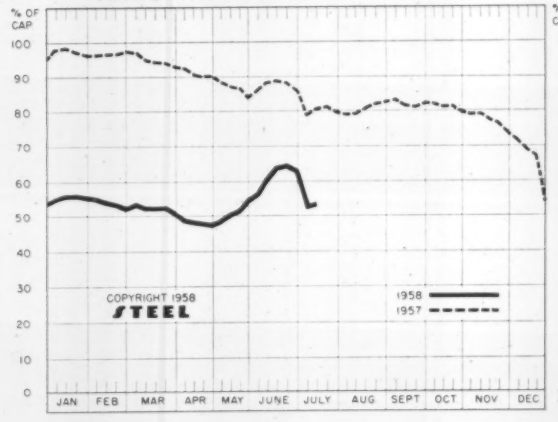
	Week Ended July 13	Change	Same Week 1957	Same Week 1956
Pittsburgh	49	— 1*	87.5	2.5
Chicago	60	— 1*	85	6
Mid-Atlantic	61	+ 5	93	9
Youngstown	42	+17	73	5
Wheeling	75.5	+ 7	80	56
Cleveland	33	+12.5*	79	0
Buffalo	39	— 2.5	88	0
Birmingham	50.5	—16	92.5	3.5
New England	30	— 9	20	8
Cincinnati	66	+ 1*	63.5	66
St. Louis	86.5	+ 1.5	80.5	95.5
Detroit	57.5	+ 5*	86	15.5
Western	68	— 2	101	30
National Rate	53.5	+ 0.5	80.5	12.5

INGOT PRODUCTION‡

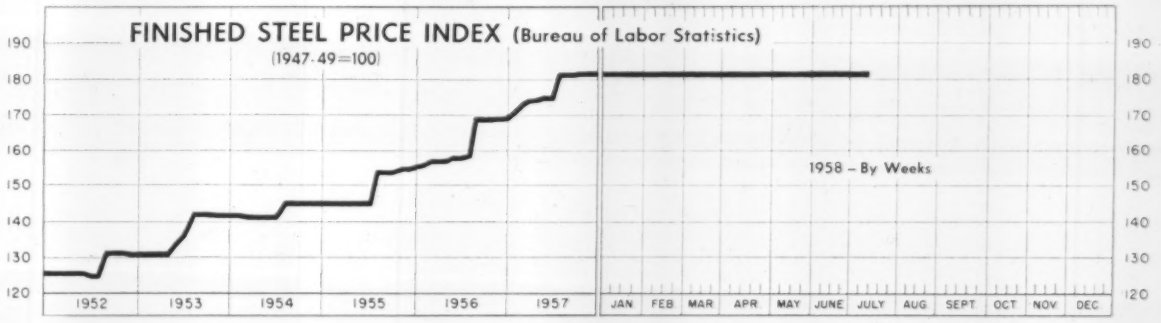
	Week Ended July 13	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	90.8†	85.7	107.6	125.4
NET TONS (In thousands)	1,459†	1,376	1,728	2,015

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



July 8, 1958	Week Ago	Month Ago	June Avg	Year Ago
181.5	181.5	181.5	181.5	181.3

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended July 8

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.600	Bars, Reinforcing	6.135
Rails, Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
Tie Plates	6.600	Bars, C.F., Alloy	13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	60.000	Sheets, H. R., Carbon	6.175
Plates, Carbon	6.150	Sheets, C.R., Carbon	7.075
Structural Shapes	5.942	Sheets, Galvanized	8.270
Bars, Tool Steel, Carbon (lb)	0.535	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.650	Sheets, Electrical	12.025
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.355	Strip, C.R., Carbon	9.214
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.850	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.525	Strip, H.R., Carbon	6.075
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	19.814
Bars, H.R., Carbon	6.425	Pipe, Galv., Buttweld (100 ft)	23.264
		Pipe, Line (100 ft)	199.023
		Casing, Oil Well, Carbon (100 ft)	194.499
		Casing, Oil Well, Alloy (100 ft)	304.610
		Tubes, Boiler (100 ft)	49.130
		Tubing, Mechanical, Carbon (100 ft)	24.953
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	10.225
		Wire, Drawn, Stainless, 430 (lb)	0.653
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	July 9 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	239.15	189.18
Index in cents per lb	6.479	6.479	6.479	6.479	5.125

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$145.42	$145.42	$145.42	$145.74	$114.84
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	64.70	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	64.23	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	65.77	57.27
Steelmaking Scrap, GT	35.67	35.67	35.67	55.17	43.17

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	July 9 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.425	4.15
Bars, H.R., Chicago	5.425	5.425	5.425	5.425	4.15
Bars, H.R., deld. Philadelphia	5.725	5.725	5.725	5.715	5.302
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	7.30*	5.20
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.275	4.10
Shapes, Std., Chicago	5.275	5.275	5.275	5.275	4.10
Shapes, deld. Philadelphia	5.545	5.545	5.545	5.585	4.38
Plates, Pittsburgh	5.10	5.10	5.10	5.10	4.10
Plates, Chicago	5.10	5.10	5.10	5.10	4.10
Plates, Coatesville, Pa.	5.10	5.10	5.10	5.50	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	5.10	4.10
Plates, Claymont, Del.	5.10	5.10	5.10	5.70	4.55
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.925	3.925
Sheets, H.R., Chicago	4.925	4.925	4.925	4.925	3.925
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	6.05	4.775
Sheets, C.R., Chicago	6.05	6.05	6.05	6.05	4.775
Sheets, C.R., Detroit	6.05	6.05	6.05	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.60	5.275
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.925	3.975-4.425
Strip, H.R., Chicago	4.925	4.925	4.925	4.925	3.925
Strip, C.R., Pittsburgh	7.15	7.15	7.15	7.15	5.45-5.95
Strip, C.R., Chicago	7.15	7.15	7.15	7.15	5.70
Strip, C.R., Detroit	7.15	7.15	7.15	7.25	5.45-6.05
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.65	5.475-5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.35-6.55
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$96.00	$75.50
Wire rods ½-⅝" Pitts.	6.15	6.15	6.15	6.15	4.525

PIG IRON, Gross Ton	July 9 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$65.50	$57.00
Basic, Valley	66.00	66.00	66.00	64.50	56.00
Basic, deld., Phila.	70.41	70.41	70.41	68.38	60.75
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	65.00	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	65.00	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	68.88	61.25
No. 2 Fdry, Birm.	62.50	62.50	62.50	60.25	52.88
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	66.70	60.43
Malleable, Valley	66.50	66.50	66.50	65.00	56.50
Malleable, Chicago	66.50	66.50	66.50	65.00	56.50
Ferromanganese, net ton	245.00†	245.00†	245.00†	255.00†	200.00*

†74-76% Mn, Duquesne, Pa. *Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$35.50	$35.50	$35.50	$56.50	$44.50
No. 1 Heavy Melt, E. Pa.	34.00	34.00	34.50	56.00	43.50
No. 1 Heavy Melt, Chicago	38.00	37.50	37.00	53.00	41.50
No. 1 Heavy Melt, Valley	38.50	36.50	36.50	54.50	45.50
No. 1 Heavy Melt, Cleve.	35.00	33.00	33.00	51.50	44.50
No. 1 Heavy Melt, Buffalo	27.50	26.50	26.50	46.50	40.75
Rails, Rerolling, Chicago	55.50	55.50	54.00	76.50	54.00
No. 1 Cast, Chicago	41.50	41.50	41.50	47.50	40.00

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.00	17.00

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2. More Jobs—Though employment in some areas has fallen off, there are 15 million more jobs than in 1939—and there will be *22 million more* in 1975 than today.

3. More Income—Family income after taxes is at an all-time high of $5300—is expected to pass $7000 by 1975.

4. More Production—U.S. production *doubles* every 20 years. We will require millions more people to make, sell and distribute our products.

5. More Savings—Individual savings are at highest level ever—*$340 billion*—a record amount available for spending.

6. More Research—*$10 billion* spent each year will pay off in more jobs, better living, whole new industries.

7. More Needs—In the next few years we will need more than *$500 billion* worth of schools, highways, homes, durable equipment. Meeting these needs will create new opportunities for everyone.

Add them up and you have the makings of another big upswing. Wise planners, builders and buyers will act *now* to get ready for it.

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Steel Prices

Mill prices as reported to STEEL, July 9, cents per pound except as otherwise noted. *Change shown in italics.* Code number following mill points indicate producing company. Key to producers, page 166; footnotes, page 168.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$73.50

INGOTS, Alloy (NT)
Detroit S41 .....$77.00
Farrell,Pa. S3 .....77.00
Lowellville, O. S3 .....77.00
Midland,Pa. C18 .....77.00
Munhall,Pa. U5 .....77.00
Sharon,Pa. S3 .....77.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$77.50
Buffalo R2 .....77.50
Clairton,Pa. U5 .....77.50
Ensley,Ala. T2 .....77.50
Fairfield,Ala. T2 .....77.50
Fontana,Calif. K1 ....88.00
Gary, Ind. U5 .....77.50
Johnstown,Pa. B3 .....77.50
Lackawanna,N.Y. B2 ..77.50
Munhall, Pa. U5 .....77.50
Owensboro,Ky. G8 ....77.50
S.Chicago,Ill. R2, U5..77.50
S. Duquesne,Pa. U5 ...77.50
Sterling,Ill. N15 .....77.50
Youngstown R2 .....77.50

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$96.00
Buffalo R2 .....96.00
Canton,O. R2 .....98.50
Clairton,Pa. U5 .....96.00
Conshohocken,Pa. A3..101.00
Ensley,Ala. T2 .....96.00
Fairfield,Ala. T2 .....96.00
Fontana,Calif. K1 ....105.50
Gary,Ind. U5 .....96.00
Geneva, Utah C11 .....96.00
Houston S5 .....101.00
Johnstown,Pa. B2 .....96.00
Lackawanna,N.Y. B2 ..96.00
Los Angeles B3 .....105.50
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
Owensboro,Ky. G8 .....96.00
Seattle B3 .....109.50
Sharon,Pa. S3 .....96.00
S.Chicago R2, U5, W14..96.00
S.Duquesne,Pa. U5 ....96.00
S.SanFrancisco B3 ...105.50
Warren,O. C17 .....96.00

Alloy, forging (NT)
Bethlehem,Pa. B2 ....$114.00
Bridgeport,Conn. C32..114.00
Buffalo R2 .....114.00
Canton,O. R2, T7 ....114.00
Conshohocken,Pa. A3..121.00
Detroit S41 .....114.00
Economy,Pa. B14 .....114.00
Farrell,Pa. S3 .....114.00
Fontana,Calif. K1 ....135.00
Gary,Ind. U5 .....114.00
Houston S5 .....119.00
Ind.Harbor,Ind. Y1 ..114.00
Johnstown,Pa. B2 .....114.00
Lackawanna,N.Y. B2..114.00
LosAngeles B3 .....134.00
Lowellville,O. S3 .....114.00
Massillon,O. R2 .....114.00
Midland,Pa. C18 .....114.00
Munhall,Pa. U5 .....114.00
Owensboro,Ky. G8 ....114.00
Sharon,Pa. S3 .....114.00
S.Chicago R2,U5,W14 ..114.00
S.Duquesne,Pa. U5 ....114.00
Struthers,O. Y1 .....114.00
Warren,O. C17 .....114.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$117.50
Canton,O. R2 .....120.00
Cleveland R2 .....117.50
Gary,Ind U5 .....117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ....117.50
Warren,O. C17 .....117.50

SKELP
Aliquippa,Pa. J5 ....5.075
Munhall,Pa. U5 .....4.875
Pittsburgh J5 .....5.075
Warren,O. R2 .....4.875
Youngstown R2, U5 ..4.875

WIRE RODS
AlabamaCity,Ala. R2 ...6.15
Aliquippa,Pa. J5 .....6.15
Alton,Ill. L1 .....6.35
Buffalo W12 .....6.15
Cleveland A7 .....6.15
Donora,Pa. A7 .....6.15
Fairfield,Ala. T2 .....6.15
Houston S5 .....6.40
IndianaHarbor,Ind. Y1 ..6.15
Johnstown,Pa. B2 .....6.15
Joliet,Ill. A7 .....6.15
KansasCity,Mo. S5 ....6.40
Kokomo,Ind. C16 .....6.25
LosAngeles B3 .....6.95
Minnequa,Colo. C10 ....6.40
Monessen,Pa. P7 .....6.15
N.Tonawanda,N.Y. B11 .6.15
Pittsburg,Calif. C11 ...6.95
Portsmouth,O. P12 .....6.15
Roebling,N.J. R5 .....6.25
S.Chicago,Ill. R2 .....6.15
SparrowsPoint,Md. B2 ..6.25
Sterling,Ill. (1) N15 ....6.15
Sterling,Ill. N15 .....6.25
Struthers,O. Y1 .....6.15
Worcester,Mass. A7 ....6.45

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.275
Atlanta A11 .....5.475
Aliquippa,Pa. J5 ....5.275
Bessemer,Ala. T2 ....5.275
Bethlehem,Pa. B2 ....5.325
Birmingham C15 ....5.275
Clairton,Pa. U5 .....5.275
Fairfield,Ala. T2 .....5.275
Fontana,Calif. K1 ....6.075
Gary,Ind. U5 .....5.275
Geneva,Utah C11 .....5.275
Houston S5 .....5.375
Ind.Harbor,Ind. I-2 ...5.275
Johnstown,Pa. B2 .....5.325
Joliet,Ill. P22 .....5.275
KansasCity,Mo. S5 ....5.375
Lackawanna,N.Y. B2 ..5.325
LosAngeles B3 .....5.975
Minnequa,Colo. C10 ....5.575
Munhall,Pa. U5 .....5.275
Niles,Calif. P1 .....5.925
Phoenixville,Pa. P4 ...5.325
Portland,Oreg. O4 ....6.025
Seattle B3 .....6.025
S.Chicago,Ill. U5, W14 5.275
S.SanFrancisco B3 ....5.925
Sterling,Ill. N15 .....5.275
Torrance,Calif. C11 ...5.975
Weirton,W.Va. W6 ....5.275

Wide Flange
Bethlehem,Pa. B2 ....5.325
Cairton,Pa. U5 .....5.275
Fontana,Calif. K1 ....6.225
IndianaHarbor,Ind. I-2 5.275
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
Phoenixville,Pa. P4 ...5.325
S.Chicago,Ill. U5 .....5.275
Weirton,W.Va. W6 ....5.275

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.65
KansasCity,Mo. S5 ....6.65
Munhall,Pa. U5 .....6.55
S.Chicago,Ill. U5 .....6.55

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....7.75
Bessemer,Ala. T2 .....7.75
Bethlehem,Pa. B2 .....7.80
Clairton,Pa. U5 .....7.75
Fairfield,Ala. T2 .....7.75
Fontana,Calif. K1 .....8.55
Gary,Ind. U5 .....7.75
Geneva,Utah C11 .....7.75
Houston S5 .....7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 .....7.80
KansasCity,Mo. S5 ....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 .....8.45
Munhall,Pa. U5 .....7.75
Seattle B3 .....8.50
S.Chicago,Ill. U5, W14 . 7.75
S.SanFrancisco B3 ....8.40
Struthers,O. Y1 .....7.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 .....7.75
S.Chicago,Ill. U5 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.325
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
S.Chicago,Ill. U5 .....5.275

STEEL SHEET PILING
Lackawanna,N.Y. B2 ..6.225
Munhall,Pa. U5 .....6.225
S.Chicago,Ill. U5 .....6.225
Weirton,W.Va. W6 ....6.225

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(15) A10 ...5.10
Atlanta A11 .....5.30
Bessemer,Ala. T2 .....5.10
Clairton,Pa. U5 .....5.10
Claymont,Del. C22 ....5.10
Cleveland J5, R2 .....5.20
Coatesville,Pa. L7 ....5.10
Conshohocken,Pa. A3 ..5.10
Ecorse, Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fontana,Calif.(30) K1 ..5.90
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.10
GraniteCity,Ill. G4 ....5.20
Harrisburg,Pa. P4 ....5.10
Houston S5 .....5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ..5.10
LoneStar,Tex. L6 .....5.20
Mansfield,O. E6 .....5.10
Minnequa,Colo. C10 ....5.95
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Pittsburgh J5 .....5.10
Riverdale,Ill. A1 .....5.10
Seattle B3 .....6.00
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14. 5.10
SparrowsPoint,Md. B2 ..5.10
Sterling Ill. N15 .....5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Youngstown U5, Y1 .....5.10

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....6.75
Fontana,Calif. K1 .....7.55
Geneva,Utah C11 .....6.75
Houston S5 .....6.85
Johnstown,Pa. B2 .....6.75
SparrowsPoint,Md. B2 ..6.75

PLATES, Wrought Iron
Economy,Pa. B14 .....13.15

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.625
Bessemer,Ala. T2 .....7.625
Cairton,Pa. U5 .....7.625
Claymont,Del. C22 ....7.625
Cleveland J5, R2 .....7.625
Coatesville,Pa. L7 .....7.625
Conshohocken,Pa. A3 ..7.625
Economy,Pa. B14 .....7.625
Ecorse,Mich. G5 .....7.625
Fairfield,Ala. T2 .....7.625
Farrell,Pa. S3 .....7.625
Fontana,Calif.(30) K1 .8.425
Gary,Ind. U5 .....7.625
Geneva,Utah C11 .....7.625
Houston S5 .....7.725
Ind.Harbor,Ind. I-2, Y1.7.625
Johnstown,Pa. B2 .....7.625
Munhall,Pa. U5 .....7.625
Pittsburgh J5 .....7.625
Seattle B3 .....8.525
Sharon,Pa. S3 .....7.625
S.Chicago,Ill. U5, W14 ..7.625
SparrowsPoint,Md. B2 ..7.625
Warren,O. R2 .....7.625
Youngstown U5 .....7.625

PLATES, ALLOY
Aliquippa,Pa. J5 .....7.20
Claymont,Del. C22 ....7.20
Coatesville,Pa. L7 .....7.20
Economy,Pa. B14 .....7.20
Fontana Calif. K1 .....8.00
Gary,Ind. U5 .....7.20
Houston S5 .....7.30
Ind.Harbor,Ind. Y1 ....7.20
Johnstown,Pa. B2 .....7.20
Lowellville,O. S3 .....7.20
Munhall,Pa. U5 .....7.20
Newport,Ky. A2 .....7.20
Pittsburgh J5 .....7.20
Seattle B3 .....8.10
Sharon,Pa. S3 .....7.20
S.Chicago,Ill. U5, W14..7.20
SparrowsPoint,Md. B2 ..7.20
Youngstown Y1 .....7.20

FLOOR PLATES
Cleveland J5 .....6.175
Conshohocken,Pa. A3 ..6.175
Ind.Harbor, Ind. I-2 ..6.175
Munhall,Pa. U5 .....6.175
S.Chicago,Ill. U5 .....6.175

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..5.35
Ashland l.c.l.(15) A10..5.85
Cleveland c.l. R2 .....5.85
Warren,O. c... R2 .....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ...5.425
Aliquippa,Pa.(9) J5 ..5.425
Alton,Ill. L1 .....5.625
Atlanta(9) A11 .....5.625
Bessemer,Ala.(9) T2 ..5.425
Birmingham(9) C15 ...5.425
Buffalo(9) R2 .....5.425
Clairton,Pa.(9) U5 ....5.425
Cleveland (9) R2 ....5.425
Ecorse,Mich.(9) G5 ...5.425
Emeryville,Calif. J7 ..6.175
Fairfield,Ala.(9) T2 ...5.425
Fairless,Pa.(9) U5 ....5.575
Fontana,Calif.(9) K1 ..6.125
Gary,Ind.(9) U5 .....5.425
Houston(9) S5 .....5.675
Ind.Harbor(9) I-2, Y1..5.425
Johnstown,Pa.(9) B2 ..5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
LosAngeles(9) B3 ....6.125
Midland,Pa.(23) C18 ..5.725
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
N.Tonawanda,N.Y.(23)B11 5.775
Owensboro,Ky.(9) G8 ..5.425
Pittsburg,Calif.(9) C11.6.125
Pittsburgh(9) J5 .....5.425
Portland,Oreg. O4 ....6.175
Seattle B3, N14 .....6.175
S.Ch'c'go(3)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5..5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15..5.425
Sterling,Ill.(9) N15 ....5.525
Struthers,O.(9) Y1 ....5.425
Tonawanda,N.Y. B12 ..5.425
Torrance,Calif.(9) C11 .6.125
Youngstown(9)R2, U5 ..5.425

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren,O. C17 .....7.475

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.475
Bethlehem,Pa. B2 ....6.475
Bridgeport,Conn. C32 ..6.55
Buffalo R2 .....6.475
Canton,O. R2, T7 ....6.475
Clairton,Pa. U5 .....6.475
Detroit S41 .....6.475
Economy,Pa. B14 .....6.475
Ecorse,Mich. G5 .....6.475
Fairless Pa. U5 .....6.625
Farrell,Pa. S3 .....6.475
Fontana,Calif. K1 ....7.525
Gary,Ind. U5 .....6.475
Houston S5 .....6.725
Ind.Harbor,Ind. I-2, Y1..6.475
Johnstown,Pa. B2 ....6.475
KansasCity,Mo. S5 ....6.725
Lackawanna,N.Y. B2 ..6.475
Lowellville,O. S3 .....6.475
LosAngeles B3 .....7.525
Massillon,O. R2 .....6.475
Midland,Pa. C18 .....6.475
Owensboro,Ky. G8 .....6.475
Pittsburgh J5 .....6.475
Sharon,Pa. S3 .....6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 ...6.475
Struthers,O. Y1 .....6.475
Warren,O. C17 .....6.475
Youngstown U5 .....6.475

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ....7.925
Bessemer,Ala. T2 .....7.925
Bethlenem,Pa. B2 ....7.925
Clairton,Pa. U5 .....7.925
Cleveland R2 .....7.925
Ecorse,Mich. G5 .....7.925
Fairfield,Ala. T2 .....7.925
Fontana,Calif. K1 ....8.625
Gary,Ind. U5 .....7.925
Houston S5 .....8.175
Ind.Harbor,Ind. Y1 ....7.925
Johnstown,Pa. B2 .....7.925
KansasCity,Mo. S5 ....8.175
Lackawanna,N.Y. B2 ..7.925
LosAngeles B3 .....8.625
Pittsburgh J5 .....7.925
Seattle B3 .....8.675
S.Chicago,Ill. U5, W14..7.925
S.Duquesne,Pa. U5 ....7.925
S.SanFrancisco B3 ....8.675
Struthers,O. Y1 .....7.925
Youngstown U5 .....7.925

BAR SIZE ANGLE; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 .....5.675
KansasCity,Mo.(9) S5 .5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 .....5.525
Sterling,Ill.(1) N15 ...5.425
Tonawanda,N.Y. B12 ..5.425

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.425
Atlanta A11 .....5.625
Joliet,Ill. P22 .....5.425
Niles,Calif. P1 .....6.125
Pittsburgh J5 .....5.423
Portland,Oreg. O4 ....6.175
SanFrancisco S7 .....6.275
Seattle B3 .....6.175

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.80
KansasCity,Mo. S5 ....6.80
Pittsburgh J5 .....6.55
Youngstown U5 .....6.55

BARS, C.F., Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 ....9.925
BeaverFalls,Pa. M12 ..9.925
Camden,N.J. P13 ....10.10
Chicago W18 .....9.95
Cleveland C20 .....9.925*
Elyria O. W8 .....9.925
LosAngeles P2, S30..11.10*
Monaca,Pa. S17 .....9.925
Newark,N.J. W18 ....10.10
SpringCity,Pa. K3 ....10.10
Warren,O. C17 .....9.925

*Grade A; add 0.50c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.30
BeaverFalls,Pa. M12,R2..7.30
Birmingham C15 .....7.50
Buffalo B5 .....7.35
Camden,N.J. P13 .....7.75
Carnegie,Pa. C12 .....7.30
Chicago W18 .....7.30
Cleveland A7, C20 .....7.30
Detroit B5, P17 .....7.50
Detroit S41 .....7.30
Donora,Pa. A7 .....7.30
Elyria,O. W8 .....7.30
FranklinPark,Ill. N5 ...7.30
Gary,Ind. R2 .....7.30
GreenBay,Wis. F7 .....7.30
Hammond,Ind. J5, L2 ..7.30
Hartford,Conn. R2 ....7.80
Harvey,Ill. B5 .....7.30
LosAngeles(49) S30 ....8.75
LosAngeles P2 R2 ....8.75
Mansfield,Mass. B5 ....7.85
Massillon,O. R2 R8 ....7.30
Midland,Pa. C18 .....7.30
Monaca,Pa. S17 .....7.30
Newark,N.J. W18 .....7.75
NewCastle,Pa.(17) B4 ..7.30
Pittsburgh J5 .....7.30
Plymouth,Mich. P5 ....7.55
Putnam Conn. W18 ....7.85
Readville,Mass. C14 ....7.85
S.Chicago,Ill. W14 ....7.30
SpringCity,Pa. K3 ....7.75
Struthers,O. Y1 .....7.30
Warren,O. C17 .....7.30
Willimantic,Conn. J5 ...7.80
Waukegan,Ill. A7 .....7.30
Youngstown F3, Y1 ....7.30

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....8.775
BeaverFalls,Pa. M12,R2 8.775
Bethlehem,Pa. B2 ....8.775
Bridgeport,Conn. C32 .8.925
Buffalo B5 .....8.775
Camden,N.J. P13 .....8.95
Canton,O. T7 .....8.775
Carnegie,Pa. C12 .....8.775
Chicago W18 .....8.775
Cleveland A7, C20 ....8.775
Detroit B5, P17 .....8.975
Detroit S41 .....8.775
Donora,Pa. A7 .....8.775
Elyria,O. W8 .....8.775
FranklinPark,Ill. N5 ..8.775
Gary,Ind. R2 .....8.775
GreenBay, Wis. F7 ....8.775
Hammond,Ind. J5, L2..8.775
Hartford,Conn. R2 ....9.075
Harvey,Ill. B5 .....8.775
Lackawanna,N.Y. B2 ..8.775
LosAngeles P2, S30 ...10.75
Mansfield,Mass. B5 ....9.075
Massillon,O. R2, R8 ...8.775
Midland,Pa. C18 .....8.775
Monaca,Pa. S17 .....8.775
Newark N.J. W18 .....8.95
Plymouth,Mich. P5 ....8.975
S.Chicago,Ill. W14 ....8.775
SpringCity,Pa. K3 ....8.95
Struthers,O. Y1 .....8.775
Warren,O. C17 .....8.775
Waukegan,Ill. A7 .....8.775
Willimantic,Conn. J5 ..9.075
Worcester,Mass. A7 ....9.075
Youngstown F3, Y1 ....8.775

BARS, Reinforcing (To Fabricators)

AlabamaCity,Ala. R2 ..5.425
Atlanta A11 .....5.425
Birmingham C15 .....5.425
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.425
Emeryville,Calif. J7 ...6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 .....6.125
Ft.Worth,Tex.(4)(26)T4 5.875
Gary,Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2, Y1 5.425
Johnstown,Pa. B2 .....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ....5.675
Kokomo,Ind. C16 .....5.525
Lackawanna,N.Y. B2 ..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ...6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 .....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPointMd. B2 ..5.425
Sterling,Ill.(1) N15 ..5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..6.00
Torrance,Calif. C11 ...6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2, U8 .....7.65
Chicago U8 .....6.91
Cleveland U8 .....6.89
Houston S5 .....7.35
Johnstown,Pa. B2 .....7.08
KansasCity,Mo. S5 ....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Philadelphia U8 .....7.38
Pittsburgh J5, U8 .....7.10
SandSprings,Okla. S5 ...7.60
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ....7.08
St.Paul U8 .....7.92
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy(Staybolt)B14 .18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 5.325
ChicagoHts.(4)(44) I-2 5.425
ChicagoHts.(4) C2 ....5.425
Franklin,Pa.(3) F5 ...5.325
Franklin,Pa.(4) F5 ...5.425
JerseyShore,Pa.(3) J8 ..5.30
Marion,O.(3) P11 ....5.325
Tonawanda(3) B12 ..5.325
Tonawanda(4) B12 ...6.00
Williamsport,Pa.(3) S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10 ..4.925
Cleveland J5, R2 .....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....4.925
Ecorse,Mich. G5 .....4.925
Fairfield,Ala. T2 ....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 ....5.675
Gary,Ind. U5 .....4.925
Geneva,Utah C11 .....5.025
GraniteCity,Ill.(8) G4 5.025
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ...4.925
Niles,O. M21, S3 .....4.925
Pittsburg,Calif. C11 ...5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill W14 ....4.925
SparrowsPoint,Md. B2 4.925
Steubenville,O. W10 ....4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5, Y1 ...4.925

SHEETS, H.R. (19) Ga. & Lighter

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ....8.10

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 .....7.275
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.275
Fairfield,Ala. T2 .....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 ....8.025
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna(35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5, W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2 7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ...7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.05
Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ...6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.05
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ....6.05
Fontana,Calif. K1 .....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 ....6.15
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ....7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 .....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ....6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled, High-Strength, Low Alloy

Cleveland J5, R2 .....8.975
Ecorse,Mich G5 .....8.975
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ..10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint(38) B2..8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	.6.95	7.20
Canton,O. R2	....6.95	7.45
Fairfield T2	.....6.95	7.20
Gary,Ind. U5	....6.95	7.20
GraniteCity,Ill. G4	7.05	...
Ind.Harbor I-2.	..6.95	7.20
Irvin,Pa. U5	.....6.95	7.20
Kokomo,Ind. C16	.7.05	...
MartinsFry. W10	6.95	7.20
Pitts.,Calif. C11	..7.70	...
Pittsburgh J5	....6.95	...
SparrowsPt. B2	..6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....7.20

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 ..6.60‡
Ashland,Ky. A10 .....6.60†
Canton,O. R2 .....6.60‡
Dover,O. E6 .....6.60†
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60†
GraniteCity,Ill. G4 ....6.70*
Ind.Harbor,Ind. I-2 ....6.60†
Irvin,Pa. U5 .....6.60†
Kokomo,Ind. C16 .....6.70‡
MartinsFerry,O. W10 ..6.60*
Middletown,O. A10 ....6.60†
Pittsburg,Calif. C11 ...7.35*
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 .6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.175

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPt.(39) B2 ..9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.425
Niles,O.(28) R2 .....7.425
Youngstown J5 .....7.275
Weirton,W.Va. W6 ....7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.25
Butler,Pa. A10 (type 2) 9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.625
Cleveland R2 .....6.625
Fairfield,Ala. T2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.725
Ind.Harbor,Ind. I-2, Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 ....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.65
Ind.Harbor,Ind. I-2 ..8.475
Yorkville,O. W10 .....8.475

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7.00
Niles,O. M21, S3 .....7.00
Warren,O. R2 .....7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.40

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D3 Dearborn Div., Sharon Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.925
Allenport,Pa. P7	4.925
Alton,Ill. L1	5.125
Ashland,Ky.(8) A10	4.925
Atlanta A11	4.925
Bessemer,Ala. T2	4.925
Birmingham C15	4.925
Buffalo(27) R2	4.925
Conshohocken,Pa. A3	4.975
Detroit M1	5.025
Ecorse,Mich. G5	4.925
Fairfield,Ala. T2	4.925
Fontana,Calif. K1	5.675
Gary,Ind. U5	4.925
Ind.Harbor,Ind. I-2, Y1	4.925
Johnstown,Pa.(25) B2	4.925
Lackaw'na,N.Y.(25) B2	4.925
LosAngeles(25) B3	5.675
Minnequa,Colo. C10	6.025
Riverdale,Ill. A1	4.925
SanFrancisco S7	6.35
Seattle(25) B3	5.925
Seattle N14	6.35
Sharon,Pa. S3	4.925
S.Chicago W14	4.925
S.SanFrancisco(25) B3	5.675
SparrowsPoint,Md. B2	4.925
Sterling,Ill.(1) N15	4.925
Sterling,Ill. N15	5.025
Torrance,Calif. C11	5.675
Warren,O. R2	4.925
Weirton,W.Va. W6	4.925
Youngstown U5	4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.10
Farrell,Pa. S3	8.10
Gary,Ind. U5	8.10
Houston S5	8.35
Ind.Harbor,Ind. Y1	8.10
KansasCity,Mo. S5	8.35
LosAngeles B3	9.30
Lowellville,O. S3	8.10
Newport,Ky. A2	8.10
Sharon,Pa. A2, S3	8.10
S.Chicago,Ill. W14	8.10
Youngstown U5, Y1	8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	7.325
Conshohocken,Pa. A3	7.325
Ecorse,Mich. G5	7.325
Fairfield,Ala. T2	7.325
Farrell,Pa. S3	7.325
Gary,Ind. U5	7.325
Ind.Harbor,Ind. I-2, Y1	7.325
Lackawanna,N.Y. B2	7.325
LosAngeles(25) B3	8.075
Seattle(25) B3	8.325
Sharon,Pa. S3	7.325
S.Chicago,Ill. W14	7.325
S.SanFrancisco(25) B3	8.075
SparrowsPoint,Md. B2	7.325
Warren,O. R2	7.325
Weirton,W.Va. W6	7.325
Youngstown U5, Y1	7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.175
Warren,O. R2	5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.15
Baltimore T6	7.15
Boston T6	7.70
Buffalo S40	7.15
Cleveland A7, J5	7.15
Dearborn,Mich. D3	7.15
Detroit D2, M1, P20	7.15
Dover,O. G6	7.15
Ecorse,Mich. G5	7.15
Evanston,Ill. M22	7.25
Follansbee,W.Va. F4	7.15
Fontana,Calif. K1	9.00
FranklinPark,Ill. T6	7.25
Ind.Harbor,Ind. Y1	7.15
Indianapolis J5	7.30
LosAngeles J5	9.05
LosAngeles C1	9.20
NewBedford,Mass. R10	7.60
NewBritain,Conn. S15	7.60
NewCastle,Pa. B4, E5	7.15
NewHaven,Conn. D2	7.60
NewKensington,Pa. A6	7.15
Pawtucket,R.I. R3	7.80
Pawtucket,R.I. N8	7.70
Philadelphia P24	7.70
Pittsburgh J5	7.15
Riverdale,Ill. A1	7.25
Rome,N.Y.(32) R6	7.15
Sharon,Pa. S3	7.15
Trenton,N.J.(31) R5	8.60
Wallingford,Conn. W2	7.60
Warren,O. R2, T5	7.15
Weirton,W.Va. W6	7.15
Worcester,Mass. A7	7.70
Youngstown J5, Y1	7.15

STRIP, Cold-Rolled Alloy

Boston T6	15.40
Carnegie,Pa. S18	15.05
Cleveland A7	15.05
Dover,O. G6	15.05
Farrell,Pa. S3	15.05
FranklinPark,Ill. T6	15.05
Harrison,N.J. C18	15.05
Indianapolis J5	15.20
Lowellville,O. S3	15.05
Pawtucket,R.I. N8	15.40
Riverdale,Ill. A1	15.05
Sharon,Pa. S3	15.05
Worcester,Mass. A7	15.35
Youngstown J5	15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.45
Dearborn,Mich. D3	10.60
Dover,O. G6	10.45
Ecorse,Mich. G5	10.50
Farrell,Pa. S3	10.50
Ind.Harbor,Ind. Y1	10.65
Sharon,Pa. S3	10.50
Warren,O. R2	10.45

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles J5	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.10	21.95	26.30
Buffalo W12	18.10	....	....
Fostoria,O. S1	18.30	22.15	....
FranklinPark,Ill. T6	18.45	22.30	26.65
Harrison,N.J. C18	18.10	21.95	26.30
New York W3	18.10	21.95	26.30
Palmer,Mass. W12	18.10	....	....
Trenton,N.J. R5	18.10	21.95	26.30
Worcester,Mass. A7, T6	18.10	21.95	26.30
Youngstown J5	18.45	22.30	26.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	7.90

STRIP, C.R. Electrogalvanized

Cleveland A7	7.15*
Dover,O. G6	7.15*
Evanston,Ill. M22	7.25*
Riverdale,Ill. A1	7.25*
Warren,O. B9, T5	7.15*
Worcester,Mass. A7	7.70*
Youngstown J5	7.15*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	7.275

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Riverdale,Ill. A1	5.50
Sharon,Pa. S3	5.35
Youngstown U5	5.35

SILICON STEEL

H.R. SHEETS(22 Ga., cut lengths)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.35	12.05	13.15	14.20
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.725*	10.95*	11.65*	12.75*	....
IndianaHarbor,Ind. I-2	9.625†	10.85*	11.55*	12.65*	....
Mansfield,O. E6	9.625*	11.35	12.05	13.15	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10	....	11.35†	12.05	13.15	14.20
					Stator
Vandergrift,Pa. U5	....	....	....	....	7.85

H.R. SHEETS (22 Ga., cut lengths)

	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	15.00	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)

	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	17.60	19.20	19.70	20.20	15.25††
Butler,Pa. A10	....	....	....	19.20	19.70	20.20
Vandergrift,Pa. U5	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower. ††Coils only.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage, Dollars per 100 lb)

Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TIN PLATE, American

	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif.K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Ind.Harb. Y1	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va.W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2, Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.65
Aliquippa,Pa. J5	7.65
Alton,Ill. L1	7.85
Atlanta A11	7.65
Bartonville,Ill. K4	7.75
Buffalo W12	7.65
Chicago W13	7.65
Cleveland A7, C20	7.65
Crawfordsville,Ind. M8	7.75
Donora,Pa. A7	7.65
Duluth A7	7.65
Fairfield,Ala. T2	7.65
Fostoria,O.(24) S1	7.75
Houston S5	7.90
Jacksonville,Fla. M8	8.00
Johnstown,Pa. B2	7.65
Joliet,Ill. A7	7.65
KansasCity,Mo. S5	7.90
Kokomo,Ind. C16	7.75
LosAngeles B3	8.60
Minnequa,Colo. C10	7.90
Monessen,Pa. P7, P16	7.65
N.Tonawanda,N.Y. B11	7.65
Palmer,Mass. W12	7.95
Pittsburg,Calif. C11	8.60
Portsmouth,O. P12	7.65
Rankin,Pa. A7	7.65
S.Chicago,Ill. R2	7.65
S.SanFrancisco C10	8.60
SparrowsPoint,Md. B2	7.75
Sterling,Ill.(1) N15	7.65
Sterling,Ill. N15	7.75
Struthers,O. Y1	7.65
Waukegan,Ill. A7	7.65
Worcester,Mass. A7	7.95

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	12.65
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	12.65
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	12.85
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	12.95
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	12.75
Struthers,O. Y1	12.65
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
NewHaven,Conn. A7	9.60
Palmer,Mass. W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester A7, J4, T6	9.60

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Bartonville,Ill. K4	9.40
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Milbury,Mass.(12) N6	9.60
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
Muncie,Ind. I-7	9.50
Palmer,Mass.(12) W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester,Mass. A7, T6	15.90

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	15.80
Bartonville,Ill. K4	15.70
Buffalo W12	15.60
Chicago W13	15.60
Cleveland A7	15.60
Crawfordsville,Ind. M8	15.70
Fostoria,O. S1	15.60
Houston S5	15.85
Jacksonville,Fla. M8	15.95
Johnstown,Pa. B2	15.60
KansasCity,Mo. S5	15.85
Kokomo,Ind. C16	15.60
Minnequa,Colo. C10	15.85
Monessen,Pa. P16	15.60
Muncie,Ind. I-7	15.80
Palmer,Mass. W12	15.90
Pittsburg,Calif. C11	16.45
Waukegan,Ill. A7	15.60
Worcester,Mass. A7, T6	15.90

ROPE WIRE (A)

Bartonville,Ill. K4	12.75
Buffalo W12	12.75
Fostoria,O. S1	12.75
Johnstown,Pa. B2	12.75
Monessen,Pa. P7	12.75
Muncie,Ind. I-7	12.95
Palmer,Mass. W12	13.05
Portsmouth,O. P12	12.75
Roebling,N.J. R5	13.05
St.Louis L8	12.75
SparrowsPt.,Md. B2	12.85
Struthers,O. Y1	12.75
Worcester,Mass. J4	13.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	16.55
Monessen,Pa. P16	16.55
Roebling,N.J. R5	17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	11.65
Baltimore T6	11.95
Boston T6	11.95
Buffalo W12	11.65
Chicago W13	11.75
Cleveland A7	11.65
Crawfordsville,Ind. MS	11.65
Dover,O. G6	11.65
Fostoria,O. S1	11.65
FranklinPark,Ill. T6	11.75
Kokomo,Ind. C16	11.65
Massillon,O. R8	11.65
Milwaukee C23	11.85
Monessen,Pa. P7, P16	11.65
Palmer,Mass. W12	11.95
Pawtucket,R.I. N8	11.95
Philadelphia P24	11.95
Riverdale,Ill. A1	11.75
Rome,N.Y. R6	11.65
Sharon,Pa. S3	11.65
Trenton,N.J. R5	11.95
Warren,O. B9	11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock	Colo.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. MS	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. MS	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity, Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$9.10

NAILS, Cut (100 lb keg)
To Dealers (33)

Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

POLISHED STAPLES	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. MS	177
Donora,Pa. A7	175
Duluth A7	175
Fairfield,Ala. T2	175
Houston S5	180
Jacksonville,Fla. MS	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	175
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.) (per 97 lb Net Box)
Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. MS	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. MS	10.36
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. MS	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. MS	10.70
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. MS	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. MS	10.75
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill. (37) N15	10.75

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. MS	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. MS	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill. (7) N15	214

FENCE POSTS

Birmingham C15	172
ChicagoHts.,Ill. C2, I-2	172
Duluth A7	172
Franklin,Pa. F5	172
Huntington,W.Va. C15	172
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	177
Sterling,Ill.(1) N15	172
Tonawanda,N.Y. B12	174

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198*
Bartonville,Ill. K4	198
Crawfordsville,Ind. MS	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. MS	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193**
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	192**
Bartonville,Ill. K4	192
Crawfordsville,Ind. MS	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. MS	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)	An'ld Galv. Stone	Stone
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa,Pa. J5	.17.15	18.95
Bartonville K4	..17.25	19.05
Cleveland A7	....17.15	....
Craw'dsville MS	17.25	19.05
Fostoria,O. S1	..17.65	19.20†
Houston S5	....17.40	18.95**
Jacksonville MS	..17.25	19.05
Johnstown B2	..17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	..17.25	18.80†
Minnequa C10	17.40	18.95**
P'lm'r,Mass.W2	17.45	19.00†
Pitts.,Calif. C11	17.50	19.05†
SparrowsPt. B2	17.25	19.05§
Sterling(37)N15	17.25	19.05††
Waukegan A7	..17.15	18.70†
Worcester A7	..17.45	....

WIRE, Merchant Quality

	An'ld Galv.
Ala.City,Ala. R2	8.65 9.20**
Aliquippa J5	....8.65 9.325§
Atlanta(48) A11	8.75 9.425*
Bartonville(48) K4	8.75 9.425
Buffalo W12	....8.65 9.20†
Cleveland A7	....8.65 ....
Crawfordsville MS	8.75 9.425
Donora,Pa. A7	..8.65 9.20†
Duluth A7	....8.65 9.20†
Fairfield T2	....8.65 9.20†
Houston(48) S5	8.90 9.45**
Jacks'ville,Fla. MS	8.75 9.425
Johnstown B2(48)	8.65 9.325§
Joliet,Ill. A7	....8.65 9.20†
Kans.City(48) S5	8.90 9.45**
Kokomo C16	....8.75 9.30†
LosAngeles B3	9.60 10.275§
Minnequa C10	..8.90 9.45**
Monessen P7(48)	8.65 9.325§
Palmer,Mass. W12	8.95 9.50†
Pitts.Calif. C11	..9.60 10.15†
Rankin,Pa. A7	..8.65 9.20†
S.Chicago R2	....8.65 9.20**
S.SanFran. C10	..9.60 10.15**
Spar'wsPt.B2(48)	8.75 9.425§
Sterling(48) N15	8.90 9.575††
Sterling(1) (48)	8.80 9.475††
Struthers,O. Y1	..8.65 9.30‡
Worcester,Mass.A7	8.95 9.50†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts
Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter	49.0
Longer than 6 in	39.0
⅝ in. thru 1 in.:	
6 in. and shorter	39.0
Longer than 6 in.	35.0
1¼ in. and larger:	
All lengths	35.0

Undersized Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	49.0

Carriage, Machine, Lag Bolts
Hot Galvanized:

½ in. and smaller:	
6 in. and shorter	29.0
Longer than 6 in.	15.0
⅝ in. and larger:	
All lengths	12.0

Lag Bolts (all diam.)

6 in. and shorter	49.0
Longer than 6 in.	39.0

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	49.0
Larger than ½ in. or longer than 6 in.	39.0

Blank Bolts 39.0
Step, Elevator, Tire Bolts 49.0
Stove Bolts, Slotted:

⅛ to ¼ in. incl.. 3 in. and shorter	55.0
⅝ to ½ in., inclusive	55.0

NUTS

Reg. & Heavy Square Nuts:

All sizes	55.5

Square Nuts, Reg. & Heavy, Hot Galvanized:

All sizes	41.0

Hex Nuts, Reg. & Heavy, Hot Pressed:

⅝ in. and smaller	60.5
¾ in. to 1 in., incl.	55.5
1⅛ in. to 1½ in., incl.	58.5
1⅝ in. and larger	53.5

Hex Nuts, Reg. & Heavy, Cold Punched:

⅝ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5

Hex Nuts, All Types, Hot Galvanized:

⅝ in. and smaller	46.5
⅞ in. to 1 in., incl.	41.5
1⅛ in. to 1½ in., incl.	46.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger	53.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:	
⅝ in. and smaller	40.0
¾, ⅞, and 1 in. diam.	22.0
Longer than 6 in.:	
⅝ in. and smaller	8.0
¾, ⅞, and 1 in. diam.	+ 6.0

High Carbon, Heat Treated:

6 in. and shorter:	
⅝ in. and smaller	26.0
¾, ⅞, and 1 in. diam.	3.0
Longer than 6 in.:	
⅝ in. and smaller	+ 13.0
¾, ⅞, and 1 in. diam.	+ 32.0

Flat Head Capscrews:

¾ in. and smaller	+ 76.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:	
6 in. and shorter	Net
Longer than 6 in.	+ 23

RIVETS

F.o.b. Cleveland and/or Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½ in., larger 12.25
⅞ in. under: List less 19%

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Strand Diameter, Inches				
	1/4	5/16	3/8	7/16	1/2
Buffalo W12	$32.15	$48.20	$61.55	$81.10	$105.65
Cleveland A7	32.15	48.20	61.55	81.10	....
KansasCity,Mo. U3	32.15	48.20	61.55	81.10	105.65
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
NewHaven,Conn. A7	32.15	48.20	61.55	81.10	105.65
Pittsburg,Calif. C11	....	48.20	61.55	81.10	....
Pueblo,Colo. W12	32.15	48.20	61.55	81.10	105.65
Roebling,N.J. R5	32.15	48.20	61.55	81.10	105.65
St.Louis L8	32.15	48.20	61.55	81.10	105.65
Waukegan,Ill. A7	32.15	48.20	61.55	81.10	105.65

RAILWAY MATERIALS

	Standard		Tee Rails	
Rails	No. 1	No. 2	All No. 2	60-lb Under
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	....
Huntington,W.Va. C15	....	....	....	6.50
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	....
Johnstown,Pa. B2	....	....	....(16)	6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C10	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.60
Ind.Harbor, Ind. I-2	6.60
Lackawanna,N.Y. B2	6.60
Minnequa,Colo. C10	6.60
Seattle B3	6.75
Steelton,Pa. B2	6.60
Torrance,Calif. C11	6.75

JOINT BARS

Bessemer,Pa. U5	6.975
Fairfield,Ala. T2	6.975
Ind.Harbor,Ind. I-2	6.975
Joliet,Ill. U5	6.975
Lackawanna,N.Y. B2	6.975
Minnequa,Colo. C10	6.975
Steelton,Pa. B2	6.975

AXLES

Ind.Harbor,Ind. S13	8.775
Johnstown,Pa. B2	8.775

TRACK BOLTS, Untreated

Cleveland R2	14.75
KansasCity,Mo. S5	14.75
Lebanon,Pa. B2	14.75
Minnequa,Colo. C10	14.75
Pittsburgh P14	14.75
Seattle B3	15.25

SCREW SPIKES

Lebanon,Pa. B2	14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	9.75
Lebanon,Pa. B2	9.75
Minnequa,Colo. C10	9.75
Pittsburgh J5	9.75
Seattle B3	10.25
S.Chicago,Ill. R2	9.75
Struthers,O. Y1	9.75
Youngstown R2	9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. Base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.: 7.60c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.30c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	+8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling—Ingot	Rerolling—Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	40.00	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	46.00	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.00	55.00
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	62.75
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	77.50	....	86.50	91.00	92.75	99.00	104.25
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	80.75	80.75
316L	....	55.50	70.00	76.50	77.00	80.75	84.50	89.25	88.50
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	106.75	....	95.25	106.75	105.50	108.00	149.25
18-S CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	28.25	....	32.00	33.75	35.00	40.25	40.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.00	48.25	48.25
420	26.00	33.50	34.25	41.75	39.25	41.25	45.25	52.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	42.00
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steels Inc.; U. S. Steel Corp.; Universal-Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

	Plates—Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	39.75
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.50	49.50	54.50	58.25
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.00	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base—Cold Rolled—10%	Both Sides
Copper*	33.10	38.75

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.305	Cr-Hot Work	0.475
Extra Carbon	0.360	W-Cr Hot Work	0.500
Special Carbon	0.475	V-Cr Hot Work	0.520
Oil Hardening	0.475	Hi-Carbon-Cr	0.925

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.285
18.25	4.25	1	4.75	....	2.500
18	4	2	9	....	2.870
18	4	2	....	....	1.960
18	4	1	....	....	1.795
9	3.5	..	....	....	1.395
13.5	4	3	....	....	2.060
13.75	3.75	2	5	....	2.440
6.4	4.5	1.9	....	5	1.300
6	4	3	....	6	1.545
1.5	4	1	....	8.5	1.155

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	73.50	74.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% and $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls, N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry. $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry. 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	82.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	....	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.00	8.90	9.68	....	8.70	8.65	12.33 #	15.18	8.50	8.65	9.75
Birmingham	8.18	9.45	10.46	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.38	10.44	11.45	53.50	9.42	9.73	12.90 #	15.28	9.63	9.72	11.20
Buffalo	8.25	9.00	11.07	55.98	8.50	8.80	11.00 #	15.00	8.90	8.90	10.45
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.20	9.45	10.10	53.00	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.10	52.43	8.54	8.92	11.06	14.86	9.18	8.93	10.21
Cleveland	8.18	9.45	10.20	52.33	8.33	8.69	10.80 #	14.74	9.01	8.79	10.11
Dallas	7.50	8.80	....	....	7.65	7.60	11.01	....	7.65	8.10	9.35
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.45	9.70	10.45	56.50	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	7.10	8.40	8.45	54.32	7.25	7.20	11.10	13.50	7.25	7.70	8.95
Jackson, Miss.	8.52	9.79	....	....	8.57	8.94	10.68	....	8.97	8.90	10.74
Los Angeles	8.25[2]	10.30[2]	11.90[2]	57.60	8.90	8.70[2]	12.10[2]	16.10	8.50[2]	8.65[2]	10.80[2]
Memphis, Tenn.	8.55	9.80	....	....	8.60	8.97	11.96 #	....	9.01	8.93	10.56
Milwaukee	8.33	9.58	10.23	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.45	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	53.08	9.31	9.57	12.76 #	15.09	9.35	9.43	10.66
Norfolk, Va.	8.40	....	....	....	9.10	9.10	12.00	....	9.40	8.85	10.35
Philadelphia	8.00	8.90	9.92	52.69	8.70	8.65	11.51 #	15.01	8.50	8.75	9.75**
Pittsburgh	8.18	9.45	10.45	52.00	8.33	8.60	10.80 #	14.65	8.64	8.56	9.88
Portland, Oreg.	8.50	11.20	11.55	57.38	9.55	8.65	14.50	15.95	8.65	8.30	11.50
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.71	....	8.84	9.21	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	55.10	9.45††	9.70	13.00	16.00	9.50	9.60	12.00
Seattle	9.95	11.15	12.20	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.15	12.20	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
Washington	8.88	....	....	....	9.36	9.56	10.94	....	9.79	9.26	10.74

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **¼ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [2]—30,000 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $150; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Clearfield, Orviston, Snow Shoe, Pa., $305; Philadelphia, $310.

70 *Per Cent:* St .Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Clearfield, Orviston, Snow Shoe, Pa., $345; Philadelphia, $350.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅝ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $30-$33, contract: Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	25.00
N. African hematite (spot)	nom.
Brazilian iron ore, 68.5%	14.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$9.50-10.00
Domestic, concentrates f.o.b. milling points	17.00-22.00

*Before duty.

Manganese Ore

Mn 46-48%, Indian (export tax included), $134.40 per long ton unit, c.i.f. U. S. ports, duty for buyer's account: other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$46.00-48.00
48% 2.8:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

48% no ratio	$32.00-34.00
44% no ratio	24.00-25.00

Turkish

48% 3:1	$51.00-55.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard	
50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: deld. east of Mississippi River, ocean bags 23,000 lb and over..	10.50
F.o.b. Riverton or Camden, N. J., west of Mississippi River.	9.50
Sponge Iron, Dometic, 98 + % Fe: Deld. east of Mississippi River, 23,000 lb and over	10.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh).	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	

Aluminum: Atomized, 500-lb drum, freight allowed	
Carlots	39.50
Ton lots	41.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	30.30-45.70†
Bronze, 5000-lb lots	45.70-49.80†
Copper: Electrolytic	14.75*
Reduced	14.75*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	74.00
Nickel-Silver, 5000-lb lots	47.80-52.60†
Phosphor-Copper, 5000-lb lots	57.80
Copper (atomized) 5000-lb lots	38.30-46.80†
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.07
Stainless Steel, 316	$1.26
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡
Tungsten:	Dollars
Melting grade, 99%	
60 to 200 mesh, nominal;	
1000 lb and over	3.15
Less than 1000 lb	3.30
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$60.75
2½	30	39.25
3	40	37.00
4	40	35.00
5¼	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa. furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.45
Saginaw, Mich., deld.	34.03
Erie, Pa., ovens	30.50
Everett, Mass., ovens: New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.29
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.85 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.30	$5.30	$5.30	$5.50
Bar Size Angles	5.05	5.05	5.05	5.42
Structural Angles	5.05	5.05	5.05	5.42
I-Beams	5.11	5.11	5.11	5.45
Channels	5.11	5.11	5.11	5.45
Plates (basic bessemer)	6.62	6.62	6.62	6.94
Sheets, H.R.	8.20	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.71	25.59	25.59	26.46
Barbed Wire (†)	6.65	6.65	6.65	7.00
Merchant Bars	6.07	6.07	6.07	6.43
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (§)	8.02	8.02	7.92	8.20

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg	29.50
Industrial xylene	32.00-34.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00-34.00

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.	

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245. Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively. (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices. 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2% from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67-71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 61-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.05c per lb of contained Cr. Packed, c.l. 31.65c, ton 33.45c, less ton 34.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload packed, SM x D, 21.25c per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 27.50c per lb contained Cr, 14.20c per lb contained Si. 0.75" x down, 28.65c per lb contained Cr, 14.20c per lb contained Si. Delivered.

Chromium Metal Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Sped Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79; 50c, freight allowed.

Vanadium Oxide: Contract less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 14.20c per lb of contained Si. Packed c.l. 16.70c, ton lot 18.15c, less ton 19.50c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c, less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 22.00c per lb of Si. Packed, c.l. 23.65c, ton lot 24.95c, less ton 25.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c. for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 19.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, carload packed in box pallets 19.80c, in bags 20.70c; 3000 lb to c.l. in box pallets 21.00c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l., bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l., bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l., pallets 9.65c; 2000 lb to c.l., bags, 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Ton lots 2" x D, $4 per lb of contained Cb; less ton lots, $4.05 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $3.80 per lb of contained Cb plus Ta, delivered; less ton lot $3.85 (nominal).

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c; less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

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Scrap Holding in Sluggish Market

Mills showing little interest in new purchases with inventories substantial and ingot operations averaging 53.5 per cent nationally. STEEL's index is unchanged at $35.67

Scrap Prices, Page 176

Cleveland—Except for a few small sales of the No. 1 grades, the scrap market in this district and in the Valley is at a standstill. No. 1 steel prices, though, are up about $2 a ton, reflecting the small sales and the growing shortage of premium scrap due to manufacturing plant vacations. No. 1 heavy melting is quoted $34.50-$35.50 here, and $38-$39 in the Valley.

Pittsburgh—Prices are steady in a slow market. Little scrap is being generated because of plant suspensions for vacations. With district mills operating at 49 per cent of capacity, 11 points below the June level, consumption is down. Brokers think the market is at bottom but expect no improvement before August. Trade is at a standstill in many yards because of a strike by workers affiliated with the AFL.

Chicago—The local scrap market continues pegged at prices attained following the late June advance of $2 a ton, but consumers are buying only token amounts. Two factors may be responsible for arresting the market buoyancy which had appeared suddenly. Steel plants have good inventories as July consumption dips, and the upswing in steelmaking later this year may be slower than anticipated.

Philadelphia — Scrap prices are unchanged here, though special strength is noted in machine shop turnings. The market on this grade is nominally $15, delivered, but it appears that any new buying will bring increases of at least $1.

New York—Scrap brokers' buying prices are unchanged, with yard stocks fairly light and little in the way of domestic demand. Spain is figuring on 85,000 tons, but for delivery over the next four months.

Buffalo—Leading steel mill grades of scrap advanced $1 a ton in this market last week when a large consumer placed July delivery orders. No. 2 heavy melting went at $24, and No. 2 bundles at $22, both up $1. At the same time, No. 1 heavy melting advanced to $27-$28, up $1, and other mill grades and specialty items joined the upswing. Blast furnace scrap and cast scrap, though, failed to share in the rise.

Detroit—Some dealers are reluctant to pay more for scrap than the last auto list prices. Others, though, seem willing to gamble $1 to $2 a ton more for bundles. Several small orders have been placed for No. 1 bundles at $34-$35, but brokers and dealers claim no large tonnages will be moved at that price.

Cincinnati — Prices are unsettled here. A late purchase last week by one mill pushed down the No. 1 grades about $1 a ton. Then, increased buying in the South of No.

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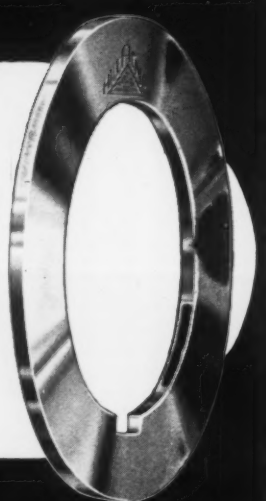

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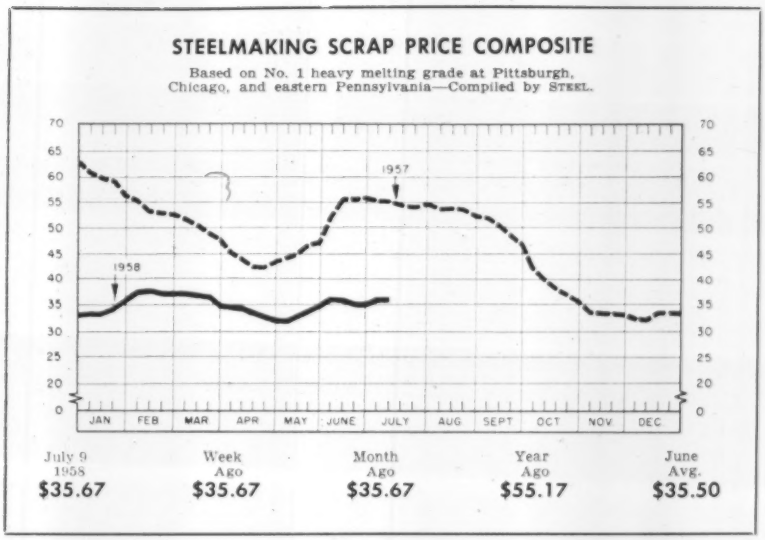
STEELMAKING SCRAP PRICE COMPOSITE
Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania—Compiled by STEEL.
1957
1958
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
July 9 1958 $35.67
Week Ago $35.67
Month Ago $35.67
Year Ago $55.17
June Avg. $35.50

1 cupola raised prices on that grade by $2. Prices also moved up $1 on No. 1 railroad heavy melting and rails 18 in. and under.

St. Louis—Scrap's undertone is stronger with market activity increasing. Local mills are taking all the material they can get at current prices. Heavy melting, bundles, and busheling prices are considerably higher on supplies coming from outside the metropolitan area.

Birmingham — Electric furnaces and foundries were active in the scrap market here last week. Electric furnace grade prices went up $1 to $2 a ton. Stove plate advanced $2 to equal the price on No. 1 cast. Buyers are now accepting mixed shipments.

Open hearth consumers are on the sidelines. They are receiving shipments of orders placed late in June. A railroad list closed at prices 50 cents to $1 higher than those paid a month ago.

Sporadic buying of scrap for export from coastal yards is reported.

Houston—The scrap trade here expects July to be slow. Only a trickle of country material is moving yardward. Brokers are mostly covered on the one outstanding mill order in this district, and no new export developments are noted.

San Francisco—Dealers anticipate a slow market for the rest of this month. Mill operations, after a promising upturn a couple weeks ago, have stalled. One big producer operated below 40 per cent of capacity last week.

Los Angeles — Dealers report limited trading in the scrap market, but steel mill operations are increasing. Most district mills are depending on their heavy inventories.

Seattle—Scrap turnover will be small this month. Buying is restricted and local yards are idle with receipts light.

Export interest is low. Only small sales are noted. Japan is reported outbidding Europeans in the purchase of obsolete ships for breaking up.

Four full cargo scrap charters were closed for June-July loading, California to Japan, at $62,250 to $71,000, freight, each. From the Gulf to Japan, a freighter was taken at $90,000; from the Gulf to Formosa one went at $95,000.

Ore Stocks Slip in May

Stocks of iron ore in the U. S. and Canada totaled 49,496,586 gross tons at the end of May, reports the American Iron Ore Association and the American Iron & Steel Institute. That's sharply above the 33,366,817 tons held at the end of May a year ago, but it's 131,872 tons below the total at the end of April this year.

Consumption during the month was 6,655,020 tons, vs. 6,351,682 in the preceding month and 11,472,198 in May last year.

Total consumption in the first five months this year was 35,260,252 gross tons; it was 57,520,399 in the same period of 1957.

At May's end there were only 160 active blast furnaces, out of a total of 275 in the U. S. and Canada. Active U. S. stacks numbered 150, Canadian, ten. On the same date last year there were 233 active stacks in the U. S. and 15 in Canada.

May Steel Shipments Rise

More active construction helped boost finished steel shipments during May, compared with April, reports the American Iron & Steel Institute. During the month, the mills shipped 4,649,499 net tons, vs. 4,372,791 in April and 6,972,091 in May last year.

Construction, including maintenance, took 824,091 tons, up 170,000 from the April total. Heavy structural shapes accounted for 346,485 tons, a gain of 45,000 from April's total. Increases were also recorded in standard pipe, piling, plates, and reinforcing bars.

Shipments to leading markets in May included: Warehouses, 881,050

(*Please turn to Page* 181)

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Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, July 9, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

July 9	$35.67
July 2	35.67
June Avg.	35.50
July 1957	54.67
July 1953	43.51

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	30.00-31.00
No. 1 dealer bundles	35.00-36.00
No. 2 bundles	25.00-26.00
No. 1 busheling	35.00-36.00
No. 1 factory bundles	40.00-41.00
Machine shop turnings	*15.00-16.00*
Mixed borings, turnings	*15.00-16.00*
Short shovel turnings	*19.00-20.00*
Cast iron borings	*19.00-20.00*
Cut structurals:	
2 ft and under	39.00-40.00
3 ft lengths	37.00-38.00
Heavy turnings	31.00-32.00
Punchings & plate scrap	40.00-41.00
Electric furnace bundles	*40.00-41.00*

Cast Iron Grades

No. 1 cupola	39.00-40.00
Stove plate	39.00-40.00
Unstripped motor blocks	23.00-24.00
Clean auto cast	39.00-40.00
Drop broken machinery	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt.	*41.00-42.00*
Rails, 2 ft and under	53.00-54.00
Rails, 18 in. and under	54.00-55.00
Random rails	50.00-51.00
Railroad specialties	*45.00-46.00*
Angles, splice bars	*44.00-45.00*
Rails, rerolling	*58.00-59.00*

Stainless Steel Scrap

18-8 bundles & solids	180.00-185.00
18-8 turnings	100.00-105.00
430 bundles & solids	100.00-105.00
430 turnings	50.00-52.00

CHICAGO

No. 1 hvy melt., indus.	*39.00-40.00*
No. 1 hvy melt., dealer	36.00-37.00
No. 2 heavy melting	33.00-34.00
No. 1 factory bundles	*43.00-44.00*
No. 1 dealer bundles	37.00-38.00
No. 2 bundles	28.00-29.00
No. 1 busheling, indus.	38.00-39.00
No. 1 busheling, dealer	36.00-37.00
Machine shop turnings	19.00-20.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Cut structurals, 3 ft	43.00-44.00
Punchings & plate scrap	44.00-45.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Stove plate	39.00-40.00
Unstripped motor blocks	34.00-35.00
Clean auto cast	47.00-48.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	42.00-43.00
R.R. malleable	53.00-54.00
Rails, 2 ft and under	54.00-55.00
Rails, 18 in. and under	55.00-56.00
Angles, splice bars	49.00-50.00
Axles	60.00-61.00
Rails, rerolling	55.00-56.00

Stainless Steel Scrap

18-8 bundles & solids	180.00-185.00
18-8 turnings	95.00-100.00
430 bundles & solids	95.00-100.00
430 turnings	50.00-55.00

YOUNGSTOWN

No. 1 heavy melting	*38.00-39.00*
No. 2 heavy melting	22.00-23.00
No. 1 busheling	*38.00-39.00*
No. 1 bundles	*38.00-39.00*
No. 2 bundles	21.00-22.00
Machine shop turnings	9.00-10.00
Short shovel turnings	13.00-14.00
Cast iron borings	13.00-14.00
Low phos.	*36.00-37.00*
Electric furnace bundles	*39.00-40.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*41.00-42.00*

CLEVELAND

No. 1 heavy melting	*34.50-35.50*
No. 2 heavy melting	22.00-23.00
No. 1 factory bundles	*38.00-39.00*
No. 1 bundles	*34.50-35.50*
No. 2 bundles	20.00-21.00
No. 1 busheling	*34.50-35.50*
Machine shop turnings	7.00-8.00
Short shovel turnings	11.00-12.00
Mixed borings, turnings	11.00-12.00
Cast iron borings	11.00-12.00
Cut foundry steel	37.00-38.00
Cut structurals, plates 2 ft and under	39.00-40.00
Low phos, punchings & plate	30.00-31.00
Alloy free, short shovel turnings	16.00-17.00
Electric furnace bundles	*35.50-36.50*

Cast Iron Grades

No. 1 cupola	42.00-43.00
Charging box cast	33.00-34.00
Heavy breakable cast	33.00-34.00
Stove plate	43.00-44.00
Unstripped motor blocks	25.00-26.00
Brake shoes	33.00-34.00
Clean auto cast	42.00-43.00
Burnt cast	30.00-31.00
Drop broken machinery	47.00-48.00

Railroad Scrap

R.R. malleable	60.00-61.00
Rails, 2 ft and under	56.00-57.00
Rails, 18 in. and under	57.00-58.00
Rails, random lengths	49.00-50.00
Cast steel	44.00-45.00
Railroad specialties	47.00-48.00
Uncut tires	40.00-41.00
Angles, splice bars	46.00-47.00
Rails, rerolling	51.00-52.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	160.00-165.00
18-8 turnings	90.00-95.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	30.00
No. 1 bundles	34.00
No. 2 bundles	23.00
No. 1 busheling	33.00
Machine shop turnings	16.00†
Short shovel turnings	18.00†

Cast Iron Grades

No. 1 cupola	41.00
Charging box cast	*35.00*
Heavy breakable cast	33.00
Unstripped motor blocks	*35.00*
Clean auto cast	44.00
Stove plate	*41.00*

Railroad Scrap

No. 1 R.R. heavy melt.	36.50
Rails, 18 in. and under	*50.00*
Rails, random lengths	45.50
Rails, rerolling	*56.00*
Angles, splice bars	45.00

BIRMINGHAM

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	30.00-31.00
No. 2 bundles	19.00-20.00
No. 1 busheling	30.00-31.00
Cast iron borings	12.00-13.00
Machine shop turnings	20.00-21.00
Short shovel turnings	21.00-22.00
Bars crops and plates	*40.00-41.00*
Structurals & plates	*39.00-40.00*
Electric furnace bundles	34.00-35.00
Electric furnace:	
2 ft and under	*35.00-36.00*
3 ft and under	*34.00-35.00*

Cast Iron Grades

No. 1 cupola	51.00-52.00
Stove plate	*51.00-52.00*
Unstripped motor blocks	39.00-40.00
Charging box cast	22.00-23.00
No. 1 wheels	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
Rails, 18 in. and under	46.00-47.00
Rails, rerolling	53.00-54.00
Rails, random lengths	*43.00-44.00*
Angles, splice bars	40.00-41.00

PHILADELPHIA

No. 1 heavy melting	34.00
No. 2 heavy melting	30.00
No. 1 bundles	34.00
No. 2 bundles	24.00
No. 1 busheling	34.00
Electric furnace bundles	36.00
Mixed borings, turnings	16.00†
Short shovel turnings	18.00
Machine shop turnings	15.00†
Heavy turnings	29.00
Structural & plate	39.00-40.00
Couplers, springs, wheels	43.50
Rail crops, 2 ft & under	55.00-56.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	40.00
Malleable	58.00-59.00†
Drop broken machinery	47.00-48.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	30.00
No. 2 bundles	16.00-17.00
Machine shop turnings	8.00-9.00†
Mixed borings, turnings	9.00-10.00†
Short shovel turnings	11.00-12.00†
Low phos (structurals & plates)	33.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips, solids	155.00-160.00
18-8 borings, turnings	50.00-55.00
410 sheets, clips, solids	50.00-55.00
430 sheets, clips, solids	60.00-65.00

BUFFALO

No. 1 heavy melting	*27.00-28.00*
No. 2 heavy melting	*23.00-24.00*
No. 1 bundles	*27.00-28.00*
No. 2 bundles	*21.00-22.00*
No. 1 busheling	*27.00-28.00*
Mixed borings, turnings	13.00-14.00
Machine shop turnings	10.00-11.00
Short shovel turnings	14.00-15.00
Cast iron borings	13.00-14.00
Low phos. structurals and plate, 5 ft and under	*32.00-33.00*
2 ft and under	*36.00-37.00*

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	39.00-40.00
No. 1 machinery	43.00-44.00

Railroad Scrap

Rails, random lengths	*46.00-47.00*
Rails, 3 ft and under	*52.00-53.00*
Railroad specialties	*36.00-37.00*

CINCINNATI

(Buyers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*33.00-34.00*
No. 2 heavy melting	28.00-29.00
No. 1 bundles	*33.00-34.00*
No. 2 bundles	*22.00-23.00*
No. 1 busheling	*33.00-34.00*
Machine shop turnings	11.50-12.50
Mixed borings, turnings	11.50-12.50
Short shovel turnings	13.50-14.50
Cast iron borings	11.50-12.50
Low phos. 18 in.	39.00-40.00

Cast Iron Grades

No. 1 cupola	*40.00-41.00*
Heavy breakable cast	32.00-33.00
Charging box cast	32.00-33.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	*39.00-40.00*
Rails, 18 in. and under	*53.00-54.00*
Rails, random lengths	43.00-44.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	32.00
No. 2 bundles	21.00†
Machine shop turnings	14.00
Short shovel turnings	17.00
Low phos. plates, structurals	36.00

Cast Iron Grades

No. 1 cupola	40.00
Heavy breakable	30.00†
Unstripped motor blocks	35.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	22.00-23.00
No. 2 heavy melting	18.00-19.00
No. 1 bundles	22.00-23.00
No. 2 bundles	14.00-15.00
No. 1 busheling	22.00-23.00
Machine shop turnings	5.00-6.00
Mixed borings, turnings	5.00-6.00
Short shovel turnings	7.00-8.00
No. 1 cast	28.00-29.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	31.00-32.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	*21.00-22.00*
No. 1 bundles	*29.00-30.00*
No. 2 bundles	18.00-19.00
No. 1 busheling	*27.00-28.00*
Machine shop turnings	8.00-9.00
Mixed borings, turnings	9.00-10.00
Short shovel turnings	*9.00-10.00*
Punchings & plate	31.00-32.00

Cast Iron Grades

No. 1 cupola	*36.00-37.00*
Stove plate	*28.00-29.00*
Charging box cast	*27.00-28.00*
Heavy breakable	*26.00-27.00*
Unstripped motor blocks	*16.00-17.00*
Clean auto cast	*37.00-38.00*

SEATTLE

No. 1 heavy melting	*30.00†*
No. 2 heavy melting	*28.00†*
No. 1 bundles	*22.00†*
No. 2 bundles	20.00†
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	9.00-10.00†
Electric furnace No. 1	38.00

Cast Iron Grades

No. 1 cupola	31.00
Heavy breakable cast	28.00
Unstripped motor blocks	23.00
Stove plate (f.o.b. plant)	21.00

LOS ANGELES

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	28.00
No. 2 bundles	20.00
Machine shop turnings	11.00
Shoveling turnings	11.00
Cast iron borings	11.00
Cut structurals and plate 1 ft and under	45.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	41.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00

SAN FRANCISCO

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	30.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Short shovel turnings	15.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	42.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Mixed borings, turnings	15.00
Busheling, new factory:	
Prepared	30.00
Unprepared	24.00
Short steel turnings	19.00

Cast Iron Grades‡

No. 1 machinery cast	45.00-50.00

†Nominal.
‡F.o.b. Hamilton, Ont.

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Firms Mark Time on Prices

There probably won't be much fluctuation until Congress acts on the Minerals Bill. Meanwhile, there's a split in copper and some softness in lead and certain zinc grades

Nonferrous Metal Prices, Pages 180 & 181

WHILE the copper, lead, and zinc industries mark time until Congress determines the fate of the Minerals Stabilization Bill, a spotty price picture confronts the buyer.

Copper—Phelps Dodge Corp., evidently motivated by the 1.7 cents a pound excise tax on copper imports which went into effect July 1, raised its price to 26.5 cents a pound on July 2, matching the quotation set by Anaconda Co. on June 17. Kennecott Copper Corp. is the only major producer still quoting 25 cents a pound.

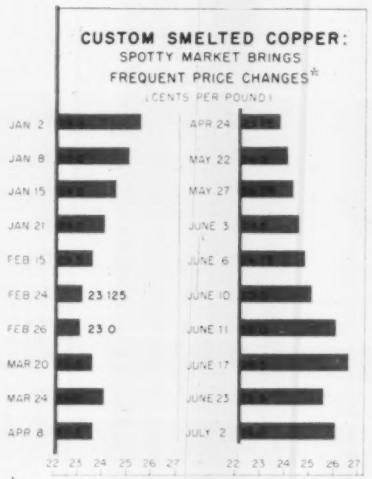
Kennecott's hesitation may be based on the fact that a much smaller percentage of its output goes to its brass mill subsidiary than is shipped by the other two major producers to their captive mills. As the major supplier to the independent mills, Kennecott may be echoing their philosophy that "present market conditions don't justify an increase in price." Both PD and Anaconda through their brass mill subsidiaries now quote fabricated shapes on the basis of 26.5-cent copper.

Custom smelters went to 26 cents a pound July 2 on the strength of PD's announcement and the inauguration of the copper excise tax. It is the twentieth price change this year (see chart). Sales haven't been particularly good at this price, but it is expected to hold for a while.

To what extent the excise tax will help firm domestic prices (by holding down imports) still isn't known. With the London Metal Exchange hovering at a little over 24 cents, and taking into account import duties and ocean freight, it seems unlikely foreign producers can economically ship any great quantities into the U. S.

Lead — Producers lowered the price 0.5 cent a pound to 11 cents (New York) on July 2. That formally signaled an end to the brief honeymoon that lead enjoyed when speculation on the commodity exchange and hedge buying to beat an anticipated firming in the market created an artificial demand.

There's little activity in the market now. The LME has dropped to around 9 cents a pound. The domestic price is far from firm but it should hold until Congress acts.



Zinc — The situation parallels lead's. Zinc can be expected to stay at 10 cents a pound until Congress acts.

Galvanizers continue to be zinc's best market. Shipments of galvanized sheets in May were the highest of the year, registering 231,318 tons. Sales of high grade to brass mills are mediocre; demand for special high grade is poor.

Reports have circulated that certain diecasters are getting a discounted price on special high grade. Some producers say they are making concessions to independent alloyers (who have to compete pricewise with the zinc companies who also make alloys) but that diecasters continue to pay the quoted price of 11.25 cents a pound.

The toughest thing to pin down now is the price of the diecasting alloy ingot grades. It's rumored most of the published prices are considerably higher than the actual selling prices.

Minerals Bill Rundown

The Senate Interior & Insular Affairs Committee has made two modifications in the Minerals Stabilization Bill: 1. Maximum subsidy payments have been set at 3.9 cents a pound for lead and 2.9 cents for zinc instead of the 4 cents for both metals originally proposed by the committee (see STEEL, July 7, p. 118). 2. A provision was added giving the interior secretary power to cut off subsidy payments to those producers whose output exceeds quarterly limitations.

The bill is now on the Senate floor. Chances of passage: Very good, says a source close to Senate leadership. He predicts early action. Prospects for House approval are said to be brighter now, but observers believe the bill still faces rough going. One source says the bill may be a "nonrecognizable corpse" when the House gets through with it.

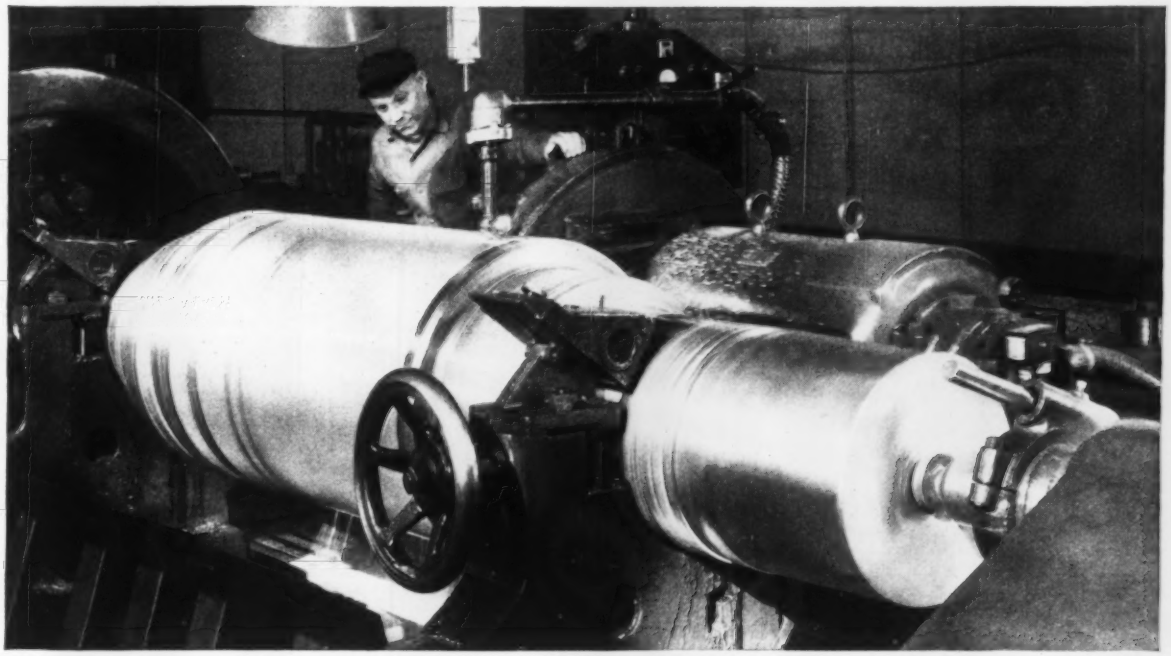
NONFERROUS PRICE RECORD

	Price July 9	Last Change		Previous Price	June Avg	May Avg	July, 1957 Avg
Aluminum	24.00	Apr.	1, 1958	26.00	24.000	24.000	25.000
Copper	25.00-26.50	June	17, 1958	25.00-26.00	25.400	24.433	28.822
Lead	10.80	July	1, 1958	11.30	11.040	11.512	13.800
Magnesium	35.25	Aug.	13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec.	6, 1956	64.50	74.000	74.000	74.000
Tin	94.00	July	9, 1958	94.125	94.701	94.510	96.576
Zinc	10.00	July	1, 1957	10.50	10.000	10.000	10.000

Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig. Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. 99.8%, Velasco, Tex.

PROGRESS IN ROLL MAKING

grinding of iron and steel rolls



NEW—

THIS PRECISION GRINDER recently installed at National is one of the largest available to the roll industry—60″ x 24′. The addition of this modern precision tool better equips National's skilled craftsmen to meet exacting requirements for precision finishing of iron and steel rolls.

Installation of the new precision grinder is a part of the extensive expansion program at National. New furnaces, new machines, new plant additions—all reflecting the growth and vitality of a new National Roll & Foundry Division designed to provide the best in iron and steel rolls.

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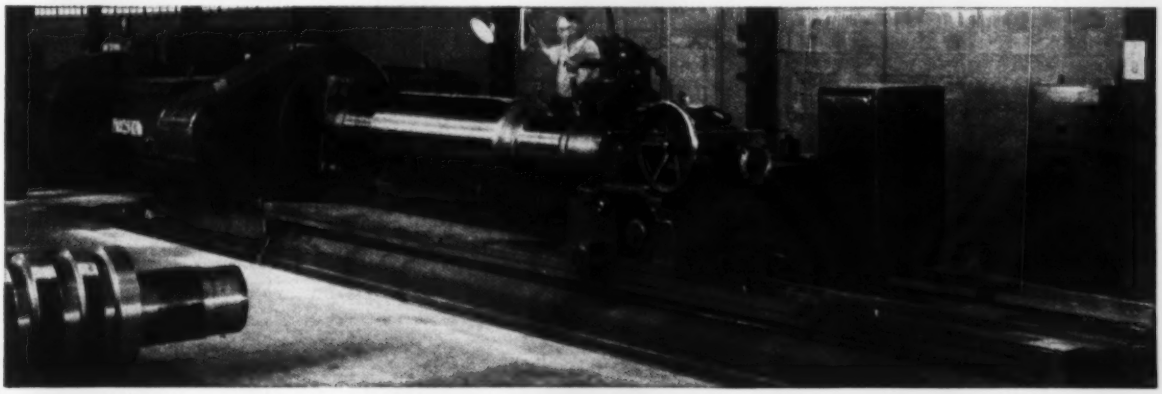
National Roll & Foundry Division
Avonmore (Westmoreland County) Pennsylvania
General Steel Castings Corporation: General Offices, Granite City, Ill.
Plants: Granite City, Ill. — Eddystone, Pa. — Avonmore, Pa.



Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.00; ingots, 26.10, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 27.90; No. 43, 27.70; No. 195, 28.70; No. 214, 29.50; No. 356, 27.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50; f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 23.50-24.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per ton, ton lots.
Cadmium: Sticks and bars, $1.55 per lb deld.
Cobalt: 97.99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 25.00-26.50 deld.; custom smelters, 26.00; lake, 25.00-26.50 deld.; fire refined, 24.75-26.25 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-80 nom. per troy oz.

Lead: Common, 10.80; chemical, 10.90; corroding, 10.90, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. thick, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $228-230 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb of more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty, New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $70-100 per troy oz nom.

Palladium: $19-21 per troy oz.

Platinum: $62-70 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market 88.625 per troy oz.

Sodium: 17.00, c.l.; 19.00-19.50 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 94.00.

Titanium: Sponge, 99.3+ % grade A-1, ductile (0.3% Fe max.), 2.05; grade A-2 (0.5% Fe max.), $1.85 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.85.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 11.00; special high grade, 11.25 deld. Diecasting alloy ingot No. 3, 12.75; No. 2, 13.25; No. 5, 13.00 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 22.50-24.00; No. 12 foundry alloy (No. 2 grade), 21.25-21.50; 5% silicon alloy, 0.60 Cu max., 24.00-24.25; 13 alloy 0.60 Cu max., 24.00-24.25; 195 alloy, 24.25-25.50; 108 alloy, 21.75. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 22.25; grade 2, 21.25; grade 3, 20.00; grade 4, 17.25.

Brass Ingot: Red brass, No. 115, 27.00; tin bronze, No. 225, 36.00; No. 245, 30.75; high-leaded tin bronze, No. 305, 31.25; No. 1 yellow, No. 405, 22.75; manganese bronze, No. 421, 24.50.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.80, f.o.b. Template, Pa., or Reading, Pa.; rod, bar, wire, $1.78, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 30.355; l.c.l., 30.98. Weatherproof, 30,000-lb lots, 32.53. Magnet wire deld., 38.43, before quantity discounts.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $15.50 per cwt; pipe, full coils, $15.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $8.50-15.95; sheared mill plate, $6.00-9.50; wire, $6.50-11.00; forging billets, $4.10-4.35; hot-rolled and forged bars, $5.25-6.35.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strips, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003, and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.249-0.136	41.10-45.60	.....
0.135-0.096	41.60-46.70	.....
0.125-0.096	.....	38.50-39.10
0.096-0.077	42.30-48.50	38.60-39.30
0.076-0.061	42.90-50.80	38.80-40.00
0.060-0.048	43.60-53.10	39.40-41.10
0.047-0.038	44.20-55.90	39.90-32.50
0.037-0.030	44.60-60.90	40.30-44.30
0.029-0.024	45.20-52.70	40.60-45.00
0.023-0.019	46.20-56.10	41.70-43.40
0.018-0.017	47.00-53.40	42.30-44.00
0.016-0.015	47.90-54.30	43.10-44.80
0.014	48.90	44.10-45.80
0.013-0.012	50.10	44.80
0.011	51.10	46.00
0.010-0.0095	52.60	47.40
0.009-0.0085	53.90	48.90
0.008-0.0075	55.50	50.10
0.007	57.00	51.60
0.006	58.60	53.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	41.70	46.50
5050-F	42.80	47.60
3004-F	43.80	49.50
5052-F	44.40	50.20
6061-T6	44.90	51.00
2024-T4	48.60	55.40
7075-T6*	56.40	64.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	76.20	73.20	....	....
0.156	64.20	61.40	....	....
0.172	....	61.40	....	....
0.188	64.20	61.40	....	79.60
0.203	64.20	61.40	....	....
0.219-0.234	61.00	59.50	....	....
0.250	61.00	59.50	88.40	75.90
0.266-0.281	61.00	59.50	....	....
0.313	61.00	59.50	81.40	72.20
0.344	60.50	....	81.40	....
Cold-Finished				
0.375-0.547	60.50	59.30	72.80	67.80
0.563-0.688	60.50	59.30	69.10	63.50
0.719	....	57.70	....	....
0.750-1.000	59.00	57.70	62.90	59.70
1.063	59.00	57.70	....	57.60
1.250-1.500	56.60	55.40	60.80	57.60
Rolled				
1.563	55.00	53.70	....	....
1.625-2.000	54.30	52.90	59.60	55.50
2.063	....	51.40	....	....
2.125-2.500	52.80	51.40	....	55.50
2.500-3.000	51.20	49.70	....	55.50
3.250-3.375	....	49.70	....	....

Forging Stock: Round, Class 1, random lengths, diam. 0.688-8 in., "F" temper; 2014, 41.50-54.30; 6061, 40.90-54.30; 7075, 42.90-56.30; 7079, 43.40-56.80.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ¾ in., 18.60; 1 in., 29.35; 1¼ in., 39.75; 1½ in., 47.50; 2 in., 57.40; 4 in., 157.60; 6 in., 282.95; 8 in., 425.80.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.00-43.50	58.60-62.80
12-14	42.00-43.50	59.30-63.80
15-17	42.00-43.50	60.50-65.50
18-20	42.50-44.00	62.50-68.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, .25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 19.75-20.25; No. 2 heavy copper and wire, 18.00-18.50; light copper, 16.00-16.50; No. 1 composition red brass, 16.00-16.50; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 26.50c)		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.13-49.63b	45.36-46.86c	....	48.32-49.82	22.500	22.500	21.750
Yellow Brass	42.69-43.57	29.53-30.28d	43.23-44.11	45.60-46.48	17.000	16.750	15.250
Low Brass, 80%	44.90-46.03	44.84-45.97	45.44-46.57	47.71-48.84	19.000	18.750	18.250
Red Brass, 85%	45.67-46.89	45.61-46.83	46.21-47.43	48.48-49.70	19.750	19.500	19.000
Com. Bronze, 90%	46.98-48.30	46.92-48.24	47.52-48.84	49.54-50.86	20.625	20.375	19.875
Manganese Bronze	50.81-51.52	44.91-45.74	55.44-56.18	....	15.875	15.625	14.875
Muntz Metal	45.19-45.95	41.00-41.76	....	....	15.875	15.625	15.125
Naval Brass	47.07-47.83	41.38-42.14	54.13-54.89	50.48-50.99	15.625	15.375	14.875
Silicon Bronze	52.84-54.37	52.03-53.56	52.88-54.41	54.77-56.29	22.125	21.875	21.125
Nickel Silver, 10%	57.93-58.82	60.26-61.15	60.26-61.15	....	22.000	21.750	....
Phos. Bronze, A-5%	67.17-68.59	67.67-69.09	67.67-69.09	68.85-70.72	23.375	23.125	22.125

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, or any or all kinds of scrap, add 1 cent per lb.

positions turnings, 15.00-15.50; new brass clippings, 13.50-14.00; light brass, 9.50-10.00; heavy yellow brass, 11.00-11.50; new brass rod ends, 11.50-12.00; auto radiators, unsweated, 12.00-12.50; cocks and faucets, 13.00-13.50; brass pipe, 13.00-13.50.

Lead: Heavy, 7.25-7.50; battery plates, 3.00-3.25; linotype and stereotype, 9.25-9.75; electrotype, 7.50-8.00; mixed babbitt, 9.00-9.50.

Monel: Clippings, 28.00-29.00; old sheets, 25.00-26.00; turnings, 20.00-23.00; rods, 28.00-29.00.

Nickel: Sheets and clips, 42.00-45.00; rolled anodes, 42.00-45.00; turnings, 37.00-40.00; rod ends, 42.00-45.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

Aluminum: Old castings and sheets, 9.50-10.00; clean borings and turnings, 6.00-6.50; segregated low copper clips, 13.00-13.50; segregated high copper clips, 12.00-12.50; mixed low copper clips, 13.00-14.00; mixed high copper clips, 11.00-11.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 10.00-10.50; clean borings and turnings, 9.00-9.50; segregated low copper clips, 15.50-16.00; segregated high copper clips, 14.00-14.50; mixed low copper clips, 15.00-15.50; mixed high copper clips, 13.50-14.00.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 9.00-9.50; clean borings and turnings, 8.00-8.50; segregated low copper clips, 12.50-13.00; segregated high copper clips, 11.00-11.50; mixed low copper clips, 11.50-12.00; mixed high copper clips, 10.50-11.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 51.00; light scrap, 46.00; turnings and borings, 31.00.

Copper and Brass: No. 1 heavy copper and wire, 21.50; No. 2 heavy copper and wire, 20.75; light copper, 18.50; refinery brass (60% copper) per dry copper content, 19.75.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 21.50; No. 2 heavy copper and wire, 20.75; light copper, 18.50; No. 1 composition borings, 18.50; No. 1 composition solids, 19.00; heavy yellow brass solids, 13.25; yellow brass turnings, 12.25; radiators, 15.25.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.55.

Copper: Flat-rolled, 41.79; oval, 40.00. 5000-10,000 lb; electrodeposited, 35.25. 2000-5000 lb lots; cast, 37.75. 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 2000 lb, 113.50; 200-499 lb, 112.00; 500-999 lb, 111.50; 1000 lb or more, 111.00.

Zinc: Balls, 16.00; flat tops, 16.00; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums.

Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 200 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30; f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.90; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 13.70; 2000-5900 lb, 11.70; 6000-11,900 lb, 11.45; 12,000-22,900 lb, 11.20; 23,000 lb or more, 10.70.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400-999 lb, 43.50; 10,000 lb or more, 40.50.

Nickel Sulphate: 5000-22,000 lb, 29.00; 23,000-35,900 lb, 28.50; 36,000 lb or more, 28.00.

Sodium Cyanide: 100 lb, 27.60; 200 lb, 25.90; 400 lb, 22.90; 1000 lb, 21.90; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 75.80; 100-600 lb, 66.80; 700-1900 lb, 64.00; 2000-9900 lb, 62.20; 10,000 lb or more, 60.80.

Stannous Chloride (anhydrous): 10 lb, 100.757; 25 lb, 100.507; 100 lb, 100.459; 400 lb, 100.434; 800-19,900 lb, 100,026; 20,000 lb or more, 96.50.

Stannous Sulphate: Less than 50 lb, 100.361; 50 lb, 100.061; 100-1900 lb, 100.041; 2000 lb or more, 100.021.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 175*)

tons, up 75,000 from April; automotive, 526,948, up 64,000; containers, 538,990, down more than 51,000.

Product shipments in the month included: cold-rolled sheets, 660,815 tons; hot-rolled sheets, 437,014; electrolytic tin plate, 402,521; plates, 403,636; hot-rolled bars and light shapes, 415,479; line pipe, 268,473; galvanized sheets, 231,318 tons.

Iron Ore . . .

Iron Ore Prices, Page 171

Shipments of Lake Superior iron ore in June amounted to 8,040,793 gross tons, reports the American Iron Ore Association. In June a year ago, the total was 13,597,376 tons. The movement from U. S. ports in June was 7,801,519 tons, vs. 13,047,448 in the same month last year. The Canadian tonnage was 239,274, vs. 549,928 in June, 1957.

The 1958 lake season movement of ore to the end of June was 12,163,964 tons, off 18,147,685 from the 30,311,649 tons moved in the like period of the 1957 shipping season.

CLASSIFIED ADVERTISING

CONTROL Your Tube Supply and Costs!

We have two Tube Mills, a McKay, capacity ½" to 2½" O.D. x Max. gage .120, and an American Electric Fusion, capacity ½" to 2½" x Max. gage .093, both complete with rolls and spares. Units are presently under power. — You can have an operative inspection. A 36" slitting line and a Forming Mill are also available.

If these facilities will help you to keep competitive and you wish to use the present "breathing spell" to make ready for the coming upsurge in activity, write **Hetz Constructors Inc., P. O. Box 671, Warren, Ohio.**

SUPERINTENDENT

For Large, Well Established, Structural Steel Fabricating Plant in Pittsburgh Area

- Excellent salary and fringe benefits.
- Must have successful background in running steel fabricating shop. Excellent opportunity for advancement for man with ability and ambition.
- Write fully, giving age, education and employment background.

All replies confidential.

Reply Box 675, STEEL

Penton Building Cleveland 13, Ohio

FOR SALE

2—G. E. Furnaces for Brazing, Heat Treating or Sintering Hand Pusher Type, complete with cooling chamber, atmosphere generator, controls and transformers. 2100°F, 50 KW, 440 Volt. Good condition. Very Reasonable price.

TRAYER PRODUCTS, INCORPORATED
Elmira, New York

YARD CRANE FOR SALE

Lorain TL-20 Self propelled Wagon Crane; s/n 17883; Waukesha Gas Engine; 40 ft. boom; 4 wheel drive; ½ yard dragbucket and fairlead. Send for snapshot.

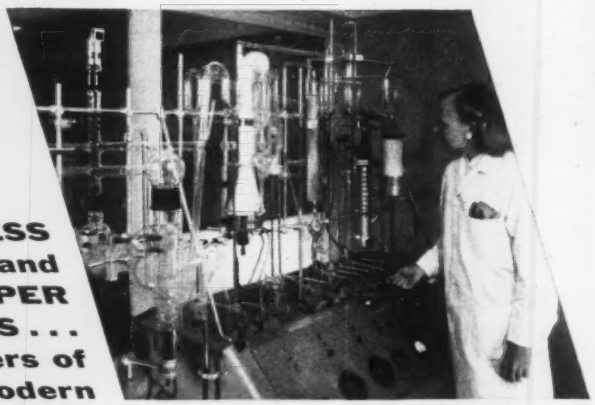
PAULSON CONSTRUCTION CO.
West Branch, Iowa Phone 233

Help Wanted
ROLL DESIGNER

For steel rolling mill in Eastern United States. Experience in small shapes required. State age, experience and salary expected to Box 673, STEEL, Penton Bldg., Cleveland 13, Ohio.

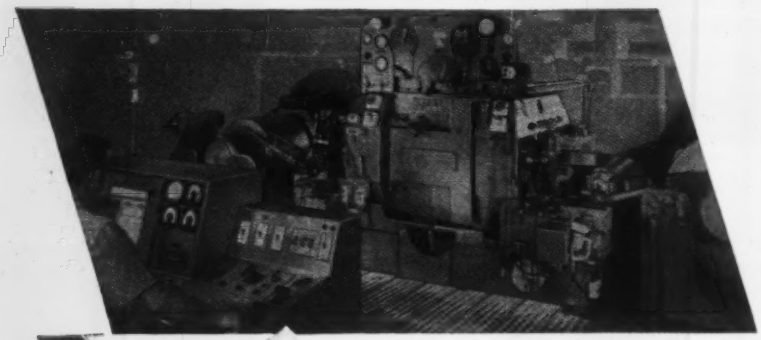
WE CAN HELP YOU TO CONTACT high calibre men to fill specific jobs you have in mind—
Readers of STEEL include men of wide training and experience in the various branches of the metalworking industry. When you have an opportunity to offer, use the Help Wanted columns of STEEL.

SALES MANAGER-ENGINEER
for industrial steel warehouse in Southern City of 800,000 population. Products handled consist of hot rolled bars, structurals, plates, sheets, cold rolled bars, reinforcing mesh, grating and includes stainless steel, aluminum and allied products as well as a complete warehouse service. Must be capable of reading plans and have experience in engineering. Logical distribution area is surrounding radius of 350 miles. We are interested only if you are experienced in steel warehouse sales, completely capable of supervising outside and inside salesmen and if you are aggressive "pusher" type. Excellent opportunity for the right man. If to accept this position you must leave your present job, give full details why you wish to leave. All replies held in strictest confidence. Please do not apply unless you completely fill qualifications. **Write Box 671, STEEL Penton Bldg. Cleveland 13, Ohio**



STAINLESS STEEL and SUPER METALS . . . workers of modern

miracles

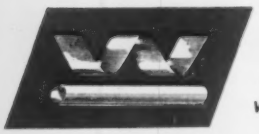


Stainless steel and super metals have so many desirable characteristics — corrosion resistance, strength, hardness, beauty, workability — they are often termed "miracle metals." But they can perform miracles *only if you select the right analysis for your particular application.* Wallingford is more qualified than ever to help you do this. Now, an all-new metallurgical laboratory and a larger staff of expert technicians are at your service.

In such fields as nucleonics, aviation and guided missiles, stainless steel and super metals will accomplish miracles *only when gages can be held to the close tolerances demanded.* Wallingford's Sendzimir Mills, equipped with non-contacting, continuous gages, assure this. A feed-back system provides fully automatic correction of the mills to maintain strip thickness with required tolerances at all times. These mills make Wallingford one of the few companies capable of producing precision strip in widths up to 27" and as thin as .001" . . . and give Wallingford the largest foil capacity in the country.

Investigate Wallingford's ability to provide stainless steel and super metals that will perform "miracles."

THE WALLINGFORD STEEL CO.



Progress in Metals for over 36 Years

WALLINGFORD, CONN., U.S.A.

COLD ROLLED STRIP: *Super Metals, Stainless, Alloy*

WELDED TUBES AND PIPE: *Super Metals, Stainless, Alloy*

Warehouse . . .

Warehouse Prices, Page 170

Demand for warehouse steel remains light. One leading distributor in the Philadelphia district estimates that July business will be off about 10 per cent, compared with last month, due primarily to vacation suspensions at consuming plants. Business in the first six months was off about 35 to 40 per cent from a year ago.

Improvement in bookings is hampered by the keen competition from mills which are making prompt deliveries in practically all product classifications. The mills are filling small tonnage orders which would be turned over to warehouses in periods of active demand.

Semifinished Steel . . .

Semifinished Prices, Page 165

Steelmaking operations are recovering slowly from the Fourth-of-July slump. Last week, the ingot rate went up only 0.5 to 53.5 per cent of capacity, compared with 80.5 per cent in the like week a year ago. The 1957 week's recovery was 2 points from the holiday slump.

Expectations are July will be a dull operating month with consumption off because of metalworking plant suspensions for vacations.

Jones & Laughlin Steel Corp. started reactivating its open hearths and blast furnaces at Cleveland last week. They have been down since February.

Pig Iron . . .

Pig Iron Prices, Page 170

A slight lift is anticipated in the movement of merchant iron. But many foundries are closed for vacations and others have such suspensions ahead of them. Hence, a spotty and quiet market is expected over the next several weeks.

Even without vacations and warm weather, most jobbing shops would operate on light schedules for some time as little casting demand is in immediate prospect.

Jones & Laughlin Steel Corp. has resumed operations at its Cleveland Works Div. The blast furnace which was idled Feb. 10 has been relighted and is producing iron.

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TO FIND THE MAN YOU NEED . . .

Place an advertisement in the "Help Wanted" columns of STEEL's classified pages. Your advertisement will reach the qualified men you need, because STEEL is addressed to highly-trained men in all phases of metalworking

STEEL
The Metalworking Weekly

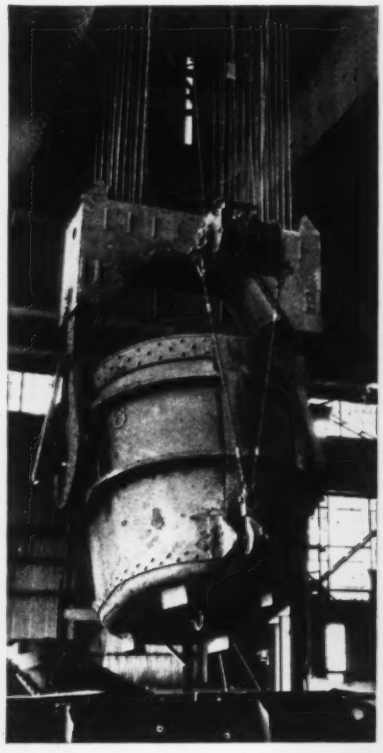
"Easy Does It" When Tuffy® Slings and Hoist Lines Tackle the Toughest Jobs

Wire rope performance isn't just a matter of strength. Regular-construction wire rope such as the Union 6 x 19 or 6 x 37 will give you the strength you need. But it makes an ornery kind of sling — stiff to handle, quick to kink and loop, subject to serious damage when bent around small radii and sharp corners.

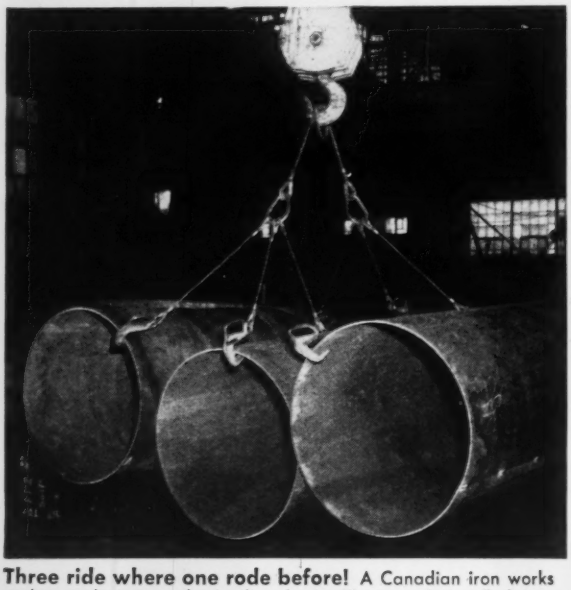
Tuffy gives you the strength you need — perfectly balanced with flexibility, toughness and other properties slings and hoist lines must have for top performance and longest service life. And Tuffy's pressed-on ferrule, applied under tremendous pressure, gives the eye-splice 100% of fabric strength.

Get in touch with your Tuffy Distributor! He'll help you save money with the longer, trouble-free life of Tuffy Slings, Hoist Lines and other Union Wire Ropes. Whether it's an emergency need or a scheduled replacement, he is stocked to give you fast service.

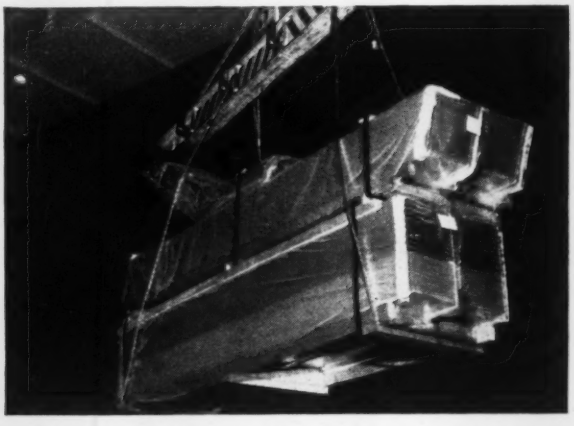
Tuffy Slings swung the "hefty" parts of this huge hydraulic press into position and then handily picked up the whole assembly to load it out for delivery. The secret of the amazing strength of all Tuffy Slings is their special purpose steel and the way it's machine-braided to give a combination of toughness and flexibility you won't find in any other sling.



Tuffy gives steel mill TWICE the service! Quoting a giant steel corporation: "We are getting double the service life from our 1¼" Tuffy Slings as we did from 6 x 37 type slings." Reason: ideal balance of strength and flexibility in Tuffy Slings. Pictured: Huge ladle, pouring tons of molten steel into furnace, is handled by a 1¼" Tuffy Sling and two 1⅛" Tuffy Hoist lines.



Three ride where one rode before! A Canadian iron works makes tanks on production-line basis. Plate steel is rolled into 8'-long tank sections, then transported by overhead crane to final assembly point. The sections used to ride suspended on a chain — one section per trip. A better idea was presented. Now a rigging of U-9 Tuffy Slings with pipe hooks handles all three sections of a tank in one crane trip.



Buildings aweigh! One of the nation's largest makers of prefabricated steel buildings speeds up production with Tuffy Slings. High flexibility makes Tuffy Slings conform perfectly to irregular load contours, hug sharp corners and snug down smoothly in a basket hitch. Handling and rigging time are cut to the bone.

union Wire Rope corp.

SUBSIDIARY USCO STEEL CORPORATION

2160 Manchester Ave. **Kansas City 26, Mo.**

Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand.

FROM WRAPPER TO CORE...

Lee Wilson assures you absolute uniformity

Because Lee Wilson has developed methods for getting the heat to the coil faster, the entire coil reaches annealing temperature more quickly. Inner wrappings of the coil thus get the same amount of heat for the same period of time as the outermost wrappings. This means that every foot of every coil has been subjected to the same condition. What's more, Lee Wilson engineers have developed a simplified remote control that makes sure the heat is directed to the correct areas every moment of the annealing period, without periodic manual furnace adjustment.

Uniformity is necessary to good annealing. If you're concerned with the quality of your product, why not talk with Lee Wilson engineers soon?

Lee Wilson* ENGINEERING COMPANY, INC.

20005 WEST LAKE ROAD • CLEVELAND 16, OHIO

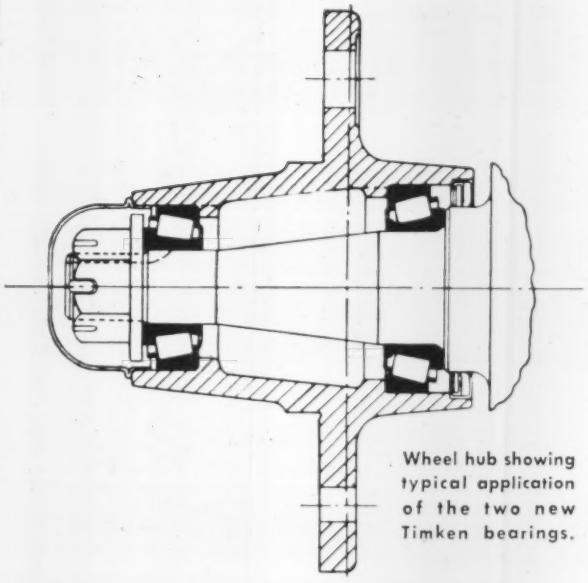
HIGH PRODUCTION ANNEALING SYSTEMS

MAKE THE BEST METALS BETTER

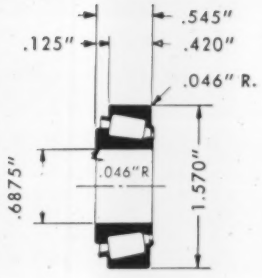
* ORIGINATORS AND LEADING PRODUCERS OF OPENED COIL AND SINGLE STACK FURNACES

601

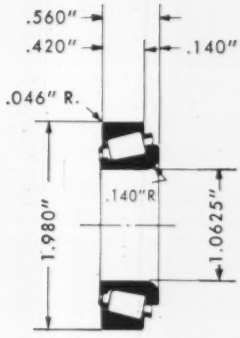
Two new, low-cost TIMKEN® bearings open new design opportunities



Wheel hub showing typical application of the two new Timken bearings.



LM 11749—LM 11710



L 44649—L 44610

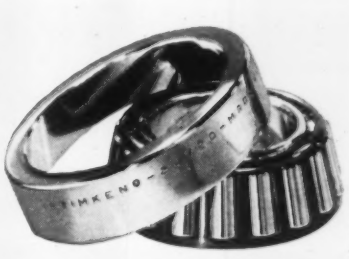
WITH the two new small size Timken® bearings shown above, machine designers can now get the advantages of tapered roller bearings where they couldn't be used before. These new, smaller bearings pack high capacity in less space, and they're lower in cost. They permit more compact designs by keeping related parts smaller—provide additional savings in hub materials, seals, nuts and dust caps.

The inner bearing weighs about four oz. (.256 lb.). The outer bearing weighs less than three oz. (.181 lb.). They're the most economical single-row Timken bearings ever produced in these bore sizes. Developed originally for use in small automobiles, they can be used wherever there is a need for a low-cost bearing in this size range ($^{11}/_{16}$" and $1^{1}/_{16}$" bore). Diagram above at left shows them in a typical application on a wheel hub for a light car. Diagram above at right shows principal dimensions.

Like all Timken bearings, these new Timken tapered roller bearings are geometrically designed and precision-made to roll true. Their taper lets them take *both* radial and thrust loads in any combination. And full-line contact between rollers and races provides extra load-carrying capacity.

Our Sales Engineers will gladly give you complete data, help you design the new bearings into your machines. Timken bearings make any machine better, because Betterness rolls on Timken tapered roller bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best



TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS ROLL THE LOAD